

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

DOCKET NO.: A.16-08-006

EXHIBIT NO.: A4NR-1

DATE:

WITNESSES: Rochelle Becker
John L. Geesman
Richard Wolfe

PREPARED DIRECT TESTIMONY OF
THE ALLIANCE FOR NUCLEAR RESPONSIBILITY
AND, IN LIMITED PART, THE SAN LUIS OBISPO MOTHERS FOR PEACE
IN
APPLICATION NO. 16-08-006
PACIFIC GAS & ELECTRIC COMPANY
RETIREMENT OF DIABLO CANYON NUCLEAR POWER PLANT

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1 **Prepared Direct Testimony of the Alliance for Nuclear Responsibility**

2 **And, in Limited Part, the San Luis Obispo Mothers for Peace**

3 **Application 16-08-006**

4 **January 27, 2017**

5
6 **A. The Alliance for Nuclear Responsibility and the San Luis Obispo Mothers for Peace**

7 The Alliance for Nuclear Responsibility (“A4NR”) is a nonprofit public benefit corporation
8 incorporated and organized under the laws of the State of California. Its principal place of business is
9 located in San Luis Obispo, California, a few miles south of the Diablo Canyon Nuclear Power Plant
10 (“DCNPP”) site. A4NR’s Executive Director is Rochelle Becker and a large portion of A4NR’s supporters
11 are residential customers of PG&E. A4NR has long advocated phasing out California’s nuclear power
12 generation and finding a long-term, permanent solution for the storage of highly radioactive waste materials
13 produced by such generation. A4NR is authorized by its bylaws and supporters to participate in rate
14 proceedings before the California Public Utilities Commission on these issues. A4NR has focused its
15 attention on addressing the financial risks faced by ratepayers due to DCNPP’s seismic vulnerabilities, and
16 has successfully sponsored legislation¹ to assure that state oversight extends beyond questions related to
17 the plant’s compliance with federal requirements related to the plant’s radiological safety. A4NR’s
18 appearances before this Commission’s proceedings have been directed toward assuring retail electric rates
19 only reflect the prudent and reasonable costs of utility nuclear power operations and are otherwise just and
20 reasonable. A4NR has intervened in numerous Commission proceedings in the pursuit of these objectives.

21 Organized in 1969, the San Luis Obispo Mothers for Peace (“SLOMFP”) is a non-profit public
22 benefit corporation concerned with the health, safety, environmental, and economic impacts of nuclear
23 weapons and nuclear power and the development of alternative energy sources. To that end, SLOMFP
24 has been an intervenor in a number of administrative proceedings concerning the operation of the DCNPP.
25 SLOMFP has participated in proceedings before the U.S. Nuclear Regulatory Commission (“NRC”) in all
26 matters pertaining to safety and the environment with regard to DCNPP’s operation. SLOMFP, by and
27 through its representatives and attorneys, has appeared before the Atomic Safety and Licensing Board, the
28 Nuclear Regulatory Commission, the Ninth Circuit Court of Appeals and the California Public Utilities

¹ See, e.g., 2006 Assembly Bill 1632 (Blakeslee), *Stats.2006*, ch.722, and 2015 Assembly Bill 361 (Achadjian), *Stats.2015*, ch.399.

1 Commission on matters related to DCNPP. In conjunction with A4NR, SLOMFP is sponsoring the
2 testimony appearing in Section B.V (“Recovery of License Renewal Costs”) below and only the testimony
3 appearing in that section.

4 **B. Testimony on the Specific Terms of the Joint Proposal**

5 A4NR’s agreement to certain, but not all, provisions of the Joint Proposal² presented by the instant
6 proceeding arose from its participation in PG&E’s Test Year 2017 General Rate Case.³ A4NR made
7 several ratemaking recommendations in that proceeding addressing PG&E’s forecasted costs of DCNPP
8 operations and planned capital projects. As part of its direct showing, A4NR juxtaposed (a) PG&E’s
9 proposed annual depreciation expense for its remaining net investment in DCNPP, which was based on the
10 assumption the plant would be retired in the years when the existing DCNPP reactor-operating licenses
11 expired, namely, 2024 for DCNPP Unit 1 and 2025 for DCNPP Unit 2, and (b) various projects and
12 activities justified on the ground that these projects and activities were necessary to support the extension
13 of those licenses for an additional twenty (20) years. A4NR recommended the Commission force PG&E to
14 abide by a single assumption as to DCNPP’s remaining life, which would have had the salutary effect of
15 reducing PG&E’s proposed revenue requirement no matter the assumption chosen. In addition, A4NR
16 proposed that the Commission impose an annual reporting obligation on PG&E pursuant to which PG&E
17 would have provided the Commission with the most recent information materially bearing on the likelihood
18 the Nuclear Regulatory Commission (“NRC”) would grant PG&E’s pending application to extend the
19 DCNPP operating licenses.⁴

20 As the *PG&E Test Year 2017 General Rate Case* proceeded, PG&E and A4NR entered into
21 settlement discussions. Those discussions were productive and resulted in provisions that were later
22 incorporated, in their entirety, into a comprehensive settlement involving virtually every active party to that
23 proceeding. In a nutshell, A4NR agreed to withdraw its recommendations and PG&E agreed to retire
24 DCNPP at the expiry of the plant’s existing operating licenses and cease its efforts before the NRC to

² See Application 16-08-006, Attachment A.

³ See Application 15-09-001, *Application of Pacific Gas & Electric Company for Authority, Among Other Things, to Increase Rates and Charges for Electric and Gas Service Effective January 1, 2017*, filed September 1, 2016 (“*PG&E Test Year 2016 General Rate Case*”).

⁴ In making this recommendation, A4NR rejected and objected to certain PG&E testimony and assertions that DCNPP license extensions were a matter outside the scope of the general rate case due to the profound effect assumptions regarding DCNPP’s remaining service life had on PG&E’s rates. As an example, A4NR proposed to reflect PG&E’s pursuit of DCNPP license extensions in determining DCNPP-related annual depreciation expense, which would have reduced DCNPP-related revenue requirement by about \$210 million per year, an approximate decrease in DCNPP-related revenue requirement of about twenty percent (20%).

1 extend those licenses.⁵ In addition, PG&E acknowledged the substantial influence and contributions of
2 A4NR's work in reaching the positions reflected in the Joint Proposal, and A4NR agreed to withdraw its
3 pending objections and recommendations regarding PG&E's recovery of certain costs through the Diablo
4 Canyon Seismic Studies Balancing Account pending in PG&E's 2013 and 2014 ERRA proceedings. The
5 terms and conditions relevant to these mutual agreements are reflected in the Joint Proposal upon which
6 Application 16-08-006 is based.

7 Although A4NR is included among the signatories to the Joint Proposal, the settlement of A4NR's
8 rate case recommendations and its support of the Joint Proposal are contingent on this Commission's
9 approval of PG&E's plans to retire DCNPP.⁶ In addition, there are certain terms and conditions in the Joint
10 Proposal to which A4NR did not agree.⁷ This testimony provides the facts and evidence upon which
11 A4NR's positions regarding the Joint Proposal are based.

12 I. Retirement of the Diablo Canyon Nuclear Power Plant

13 A4NR fully supports DCNPP's retirement upon or prior to the expiry of the plant's current operating
14 licenses in 2024 and 2025. Since A4NR's formation, A4NR has asked the Commission to address and limit
15 the financial risks faced by PG&E electric customers related to and arising from PG&E's operations at
16 Diablo Canyon.⁸ The capital and expense requirements of operating and maintaining the safety and
17 reliability of the plant are extremely high relative to the utility's other energy-supply assets. In addition to
18 the rate impacts resulting from DCNPP's high costs, PG&E electric customers face considerable
19 uncertainty as to other foreseeable, significant, but indeterminate costs which are inherent in the operation
20 of nuclear power facilities in general and this particular plant specifically. This financial and economic
21 uncertainty will exist for as long as the plant remains in service. The previously indeterminate period during

⁵ See *Joint Motion of Office of Ratepayer Advocates, the Utility Reform Network, Alliance for Nuclear Responsibility, et al., and Pacific Gas & Electric Company for Adoption of Settlement Agreement*, Attachment 1 ("Settlement Agreement"), Sections 3.1.10.1.1, *et seq.*, and 3.2.3.1, Application 15-09-001, filed August 3, 2016. The Settlement Agreement provides that, in the event the Commission takes any action causing PG&E to reconsider its decision to retire DCNPP, A4NR should be permitted to resurrect the issues it raised in the *PG&E Test Year 2017 General Rate Case*.

⁶ See Joint Proposal, Sections 1.1 and 1.3.

⁷ See Joint Proposal, *e.g.*, Sections 2 ("Greenhouse Gas Free Replacement Resources") and 5.2 ("License Renewal Costs"), 6.1 ("Actions at Other Governmental Agencies: State Lands Commission"), and 6.4 ("Actions at Other Governmental Agencies: NRC Dry Cask Fuel Storage").

⁸ In the *PG&E Test Year 2017 General Rate Case*, A4NR proposed that the Commission address financial, safety and reliability risks posed by DCNPP operations by making the collection of DCNPP-related revenue requirement subject to the terms of a performance-based ratemaking mechanism. This proposal was prompted by analytical defects and omissions A4NR identified in PG&E's risk analyses related to DCNPP operations.

1 which PG&E intended to operate Diablo Canyon heightened this uncertainty and ratepayers' exposure to
2 financial, safety and reliability risks since extending the operating lives of these two aging units would
3 coextensively lengthen the period during which PG&E might experience the occurrence of any number of
4 reliability, performance and safety failures. Under California ratemaking, PG&E customers stand first in line
5 to absorb the potential costs of addressing and recovering from any such failures. As a result, A4NR has
6 always advocated that the Commission adopt ratemaking practices that would reallocate to PG&E
7 management and shareholders more of the financial risks inherent in nuclear operations and the operation
8 of this facility.

9 A4NR believes PG&E's proposal to retire DCNPP no later than the expiration of the plant's current
10 operating licenses limits the degree to which PG&E's customers will face the financial risks and
11 uncertainties associated with PG&E's nuclear power operations. A4NR would certainly support an earlier
12 retirement date since an earlier retirement would further limit the financial risks and uncertainties faced by
13 PG&E's customers, but A4NR believes the proposed coincident timing of plant retirement upon license
14 expiration provides a reasonably definitive end to the rate and financial burdens allocated to and borne by
15 PG&E electric customers. For these reasons, A4NR supports the terms of the Joint Proposal related to
16 DCNPP's retirement.

17 **II. Proposed Replacement Procurement**

18 As to those provisions of the Joint Proposal addressing the replacement of DCNPP with other
19 resources, A4NR generally supports the public policies and reasoning articulated by PG&E in support of
20 those provisions.⁹ A4NR believes an orderly and gradual replacement of DCNPP capacity and energy will
21 be better planned and less costly than might be the case if those procurements were to be conducted
22 abruptly under exigent or tragic circumstances. A4NR believes any replacement resources should possess
23 attributes and provide benefits consistent with state climate, environmental and energy policies. The Joint
24 Proposal's citation of these policies and principles provide A4NR with further reason to support the
25 retirement of DCNPP upon the expiration of the plant's existing operating licenses. A4NR does not,
26 however, take any position as to the reasonableness of the specific proposals recited in the Joint Proposal
27 regarding the manner in which PG&E should conduct the procurement of replacement resources or how
28 the costs of those resources should be reflected in rates.

29

⁹ See Joint Proposal, Section 2.

1 **III. Proposed Employee Retention and Severance Program**

2 A4NR fully supports the provisions of the Joint Proposal addressing employee retention and
3 severance programs.¹⁰ These programs are designed to maintain a skilled, experienced workforce until
4 such time as DCNPP ceases power operations. This is important to minimizing the risks of safety,
5 reliability and financial failures during what remains of the plant’s service life and A4NR recommends the
6 Commission adopt these provisions of the Joint Proposal, including PG&E’s proposal regarding the
7 recovery of these costs through its nuclear decommissioning rates.

8 **IV. Proposed Community Impacts Mitigation Program**

9 A4NR fully supports the provisions of the Joint Proposal, as modified by the Settlement Agreement
10 filed in this matter on December 28, 2016,¹¹ providing continuing revenue streams of limited duration that
11 will be used to address local community needs and concerns.¹² In particular, it is extremely important for
12 the Commission to approve the provisions of the Joint Proposal related to continuing existing state and
13 local emergency-planning activities, including the maintenance of public-warning sirens and community and
14 statewide emergency-planning functions, at least until such time as PG&E surrenders the DCNPP Part 50
15 licenses at the conclusion of plant decommissioning.¹³ At present, PG&E provides some ninety percent
16 (90%) of the funding relied upon by the County of San Luis Obispo Office of Emergency Services and the
17 funds provided under the Joint Proposal provide some assurance that this agency and other similar local
18 and state agencies with first-response and disaster-recovery responsibilities are properly alerted to and
19 equipped to deal with events potentially leading to the release of radiologically hazardous materials both
20 onsite and offsite, which in turn might pose threats to life and property in the local area. These systems
21 and functions are an important aspect of addressing public safety and must be maintained well beyond the
22 cessation of DCNPP’s power production operations.

¹⁰ See Joint Proposal, Section 3.

¹¹ See *Joint Motion of Pacific Gas & Electric Company, the County of San Luis Obispo, et al., and Alliance for Nuclear Responsibility for Adoption of Settlement Agreement*, Application 16-08-006, December 28, 2016 (“December 2016 Settlement Agreement”).

¹² See Joint Proposal, Section 4. See also, *December 2016 Settlement Agreement*.

¹³ See Joint Proposal, Section 5.4.1. A4NR originally planned to address the duration of emergency-planning funding as part of its testimony in this proceeding, but will now defer this matter to a future nuclear decommissioning cost triennial proceeding. This will allow A4NR to make a better informed recommendation as PG&E develops more comprehensive plans for the long-term management and storage of the DCNPP spent-fuel inventories, a topic PG&E has agreed to address in consultation with the California Energy Commission as part of the PG&E-A4NR settlement in the *PG&E Test Year 2017 General Rate Case*.

1 Recently, the Governor signed 2016 Senate Bill 968 into law.¹⁴ The bill enacted new Public
2 Utilities Code Section 712.5 and requires the Commission to complete a third-party assessment of the
3 adverse and beneficial economic impacts for the County of San Luis Obispo and the surrounding regions
4 affected by DCNPP's temporary or permanent shutdown, including a review of "potential actions for the
5 state and local jurisdictions to consider in order to mitigate the adverse economic impact of a shutdown."¹⁵
6 The community-impacts provisions of the Joint Proposal, as modified by the *December 2016 Settlement*
7 *Agreement*, are well within the spirit of this legislation and should be adopted by the Commission, including
8 PG&E's proposal to recover these costs through PG&E's nuclear decommissioning rates.

9 **V. Recovery of License Renewal Costs**

10 **a. Introduction**

11 PG&E proposes to recover \$52.7 million of costs the company incurred in support of its pursuit of
12 DCNPP license extensions beyond 2024-2025 through an eight-year amortization reflected in generation
13 rates.¹⁶ A4NR and SLOMFP recommend the Commission deny rate recovery of any of these costs on four
14 separate grounds.

15 **b. PG&E's Failure to Obtain a Regulatory Approval to Proceed with License** 16 **Renewal**

17 The subject of whether PG&E should seek an extension of the DCNPP operating licenses first
18 arose in PG&E's Test Year 2007 General Rate Case.¹⁷ In that case, PG&E sought to increase its electric
19 revenue requirement by \$17 million to fund a DCNPP "license renewal feasibility study," despite the fact
20 that DCNPP's existing licenses had nearly twenty (20) years left to run.

21 A4NR, among others, objected to PG&E's request for funds on the grounds the license-renewal
22 feasibility study was unwarranted and premature. PG&E responded by claiming that the need to complete
23 the study, and for the Commission to review the study results, were matters of some urgency. In arguing
24 against delaying the study to a later date as proposed by A4NR, PG&E insisted that a final NRC decision
25 on license renewal needed to be received no later than 2014. PG&E argued that this timeline would allow,

¹⁴ *Stats.2016*, Chapter 674.

¹⁵ Public Utilities Code Section 712.5, subdivisions (a)(1) and (b)(4). The Commission was given until July 1, 2018, to complete the assessment.

¹⁶ See *Application*, pp.3, 13.

¹⁷ See *Application of Pacific Gas & Electric Company for Authorization, Among Other Things, to Increase Rates and Charges for Electric and Gas Service Effective on January 1, 2007*, docketed as Application 05-12-002, filed December 2, 2005.

1 in the event of an adverse NRC decision, ten (10) years for PG&E to replace DCNPP energy and capacity
2 in a timely and prudent manner – according to PG&E, the feasibility study was a necessary precursor to
3 any NRC filing and would determine whether any safety, technical or environmental impediments¹⁸ posed a
4 threat to receiving a favorable NRC decision. A4NR characterized these arguments as a mere subterfuge
5 and warned the Commission that PG&E would use the funding and resulting “feasibility study” to proceed to
6 seek NRC license extensions – A4NR pointed out that the NRC had routinely, quickly and without
7 exception granted each and every request for license extension that had been filed to date and that PG&E
8 could only be excited by its prospects of success.¹⁹ PG&E responded by denying that it would proceed to
9 an NRC filing without seeking this Commission’s prior authorization through an appropriate application and,
10 following the issuance of a Proposed Decision granting the funding request as part of the general rate case,
11 assured the Commission it understood the limits of the proposed order by offering this self-admonition in its
12 comments on the Proposed Decision: “the Commission ‘has ample means to deal with PG&E’s failure to
13 comply with the Commission’s order to file an application, if that should ever come to pass.’”²⁰

14 In its disposition of the *PG&E Test Year 2007 General Rate Case*, the Commission proceeded to
15 grant PG&E’s request for the funds needed to conduct the license-renewal feasibility study, but in doing so
16 rejected the implication that it was authorizing PG&E to proceed to file with the NRC for license extensions.
17 The Commission adopted a condition articulated in the Proposed Decision directing PG&E, upon
18 completion of the feasibility study, to file an application addressing “whether license renewal is cost
19 effective and in the best interest of ratepayers.”²¹ In reaching its conclusions with respect to the conduct
20 and funding of the license-renewal feasibility study, the Commission essentially agreed with PG&E that the
21 study would set the stage for an early review, *i.e.*, in the PG&E Test Year 2010 General Rate Case and/or

¹⁸ The safety, technical and environmental issues addressed by the license-renewal feasibility study were not ecumenical, but rather were limited to matters reflected in NRC regulations. The proposed study design excluded matters related to other federal and state regulations affecting DCNPP’s design, operations or economic cost-effectiveness.

¹⁹ These positions were memorialized in the Commission’s *Opinion Authorizing Pacific Gas and Electric Company’s General Rate Case Revenue Requirement for 2007-2010* (“*PG&E Test Year 2007 General Rate Case*”), Decision 07-03-044 in Application 05-12-002, *et al.*, printed opinion at p.98.

²⁰ See *PG&E Test Year 2007 General Rate Case, id.*, printed opinion at p.104 (footnote omitted), where the Commission noted its agreements with this language, taken from PG&E’s opening comments on the pending Proposed Decision.

²¹ See *PG&E Test Year 2007 General Rate Case, id.*, printed opinion at p.103. The Commission went on to describe that “the proceeding in 2011 will result in a decision on whether to pursue license renewal based on circumstances at that time, and that the results of the proceeding will be incorporated into the [California Energy Commission’s] 2013 [Integrated Energy Policy Report] and the Commission’s 2014 [Long-Term Procurement Proceeding].”

1 as part of the 2014 Long-Term Procurement Plan proceeding, of whether DCNPP should either remain in
2 the PG&E resource portfolio or be retired and replaced.

3 Notwithstanding the terms of the Commission's order and PG&E's denial that it would make a filing
4 with the NRC in advance of Commission review of the license-renewal feasibility study, PG&E in fact
5 proceeded to file an application with the NRC seeking the approval of twenty-year license extensions for
6 each of the two DCNPP units on November 23, 2009, *well in advance of the filing of PG&E's application to*
7 *this Commission for approval of PG&E's pursuit of the DCNPP license renewals.*²² PG&E explained its
8 hurry to file the NRC application by reiterating its claim from the Test Year 2007 General Rate Case, *i.e.*,
9 that PG&E would need ten (10) years to procure replacement resources in the event the NRC denied
10 PG&E's license-renewal request. In addition, PG&E indicated that the timing of its NRC filing was dictated
11 by its agreement to an application schedule established by the Strategic Teaming and Resource Sharing
12 ("STARS") consortium, an industry group of which PG&E is a member. In support of its decision to proceed
13 with license renewal, PG&E provided, as part of its *Renewal Cost Application*, an internal cost-benefit study
14 which found that extending DCNPP's service life by twenty (20) years could provide a projected net life-
15 cycle benefit of between \$3.5 billion to \$16 billion.²³

16 Prior to evidentiary hearings in the *Renewal Cost Application*, PG&E entered into a contested
17 three-party settlement with the Division of Ratepayer Advocates ("DRA") and The Utility Reform Network
18 ("TURN").²⁴ Although DRA and TURN had opposed the application on various grounds, including their
19 substantial doubts as to the veracity of PG&E's economic analysis regarding DCNPP's future value to
20 customers, the settlement proposed that PG&E should (1) proceed with the NRC license-renewal
21 application, (2) limit the costs associated with license renewal to \$80 million, subject to the proviso that
22 PG&E could recover costs in excess of that amount if approved by the Commission following a
23 reasonableness review to be conducted as part of a general rate case, and (3) provide updated DCNPP
24 cost-effectiveness analyses and risk analyses in PG&E's next general rate case.²⁵ The required analyses

²² See *Application of Pacific Gas and Electric Company to Recover the Costs Associated with Renewal of the Diablo Canyon Power Plant Operating Licenses*, docketed as A.10-01-022, January 29, 2010 ("*Renewal Cost Application*").

²³ *Ibid.*

²⁴ See *Joint Motion of Pacific Gas and Electric Company, the Division of Ratepayer Advocates and The Utility Reform Network for Approval of Settlement Agreement*, Application 10-01-022, November 16, 2010 ("*Joint Motion re Renewal Cost Application Settlement*").

²⁵ *Joint Motion re Renewal Cost Application Settlement*, at p.4.

1 were intended to “assure” the Commission “that continued operation [of DCNPP] remains in the best
2 interest of PG&E’s customers.”²⁶

3 A4NR opposed the three-party settlement on various grounds, including that PG&E had failed the
4 preconditions set by the Commission in *PG&E Test Year 2007 General Rate Case*, which included the
5 important requirement that PG&E submit various information for Commission review *prior to filing for*
6 *license renewal before the NRC.*²⁷ A4NR further disputed whether the analyses required of PG&E under
7 the settlement would be comprehensive since the settlement failed to mention the pending mitigation
8 requirements expected under the State Water Resources Control Board’s regulations limiting the use of
9 marine waters for power plant cooling. A4NR also argued PG&E should be required, prior to being
10 authorized to proceed with the DCNPP license extensions, to complete pending studies related to
11 DCNPP’s seismic setting and related safety, reliability and economic concerns as required under newly
12 enacted Public Resources Code Sections 25303(a)(8) and 25303(c).²⁸

13 Shortly before the evidentiary hearings on the settlement were to be convened, the Tohoku
14 seismic-tsunami event occurred, resulting in the catastrophic failure of the Fukushima Daiichi nuclear units,
15 and the Commission was presented with competing motions as to how to proceed to disposition of the
16 *Renewal Cost Application*. Two of the settling parties (PG&E and TURN, but not the ORA) proposed
17 suspending the matter until the completion of the ongoing seismic studies required by Public Resources
18 Code Sections 25303(a)(8) and 25303(c) and, relatedly, in accordance with NRC schedule revisions for the
19 pending license-renewal application.²⁹ Opponents to the settlement, including A4NR, moved for the
20 *Renewal Cost Application*’s outright dismissal. In arguing for dismissal, A4NR noted that the need to
21 complete the DCNPP seismic studies prior to the filing of any application with the NRC should have been
22 apparent to PG&E long before the disastrous Fukushima Daiichi failures. As a result, A4NR questioned the
23 prudence of the costs PG&E had incurred to date in the pursuit of license renewal and recommended the
24 Commission bar the recovery of those costs through rates rather than proceed any further.³⁰ Because the

²⁶ *Joint Motion re Renewal Cost Application Settlement*, at p.6.

²⁷ See *Comments of the Alliance for Nuclear (sic), Sierra Club, CalPIRG and Environment California Research and Policy Center Opposing the Settlement Agreement*, Application 10-01-022, December 14, 2010.

²⁸ See *Testimony of Rochelle Becker [etc.]*, Application 10-01-022, February 18, 2011. See also, 2006 Assembly Bill 1632 (Blakeslee), *Stats.2006*, ch.722, enacting the new code sections.

²⁹ The NRC by this time had suspended, at PG&E’s request, PG&E’s license-renewal application pending completion of the seismic studies required by California law. See *Decision Granting Motion to Dismiss the Application of Pacific Gas and Electric Company*, Decision 12-02-004 in Application 10-01-022, February 1, 2012, printed opinion at p.3.

³⁰ See *The Alliance for Nuclear Responsibility, Sierra Club, CalPIRG, Environment California Research and Policy Center Opposition to PG&E and TURN’s Motion to Suspend Proceedings Pending Completion of Seismic Studies*, Application 10-01-022, June 17, 2011, at pp.1 and 10. This opposition reiterated the focal grounds upon which A4NR

1 completion date for the seismic studies was uncertain and hardly imminent, the Commission chose to
2 dismiss the application, subject to a future motion by PG&E to reopen the proceeding “when the time is
3 ripe.”³¹

4 The foregoing regulatory history provides multiple policy and factual grounds for denying the rate
5 recovery of any of the costs incurred by PG&E in its pursuit of license extensions for the DCNPP units.
6 First and foremost, the Commission set the seminal precondition to the making of any filing with the NRC
7 early and clearly. The Commission unequivocally directed PG&E to demonstrate, upon completion of the
8 license renewal feasibility study, “*whether license renewal is cost effective and in the best interest of*
9 *ratepayers.*”³² Because the *Renewal Cost Application* was never prosecuted to disposition and PG&E
10 never moved to reopen the proceeding, PG&E has never made any such a demonstration to the
11 satisfaction of the Commission.

12 Although PG&E submitted an economic analysis of extending DCNPP’s service life as part of the
13 *Renewal Cost Application*, the foregoing record indicates the analysis was heavily criticized. Rather than
14 proceed to a disposition of the merits of its economic analysis, PG&E itself, as part of the three-party
15 settlement in the *Renewal Cost Application*, agreed the study should be updated and submitted in some
16 subsequent proceeding using better assumptions and more robust parameters such as (i) adding
17 alternative economic scenarios relevant to prudent resource planning and (ii) reflecting “any known,
18 unquantified risks that may significantly impact the economics of project operations through the forecasted
19 period.”³³ The errors and omissions in PG&E’s economic study loomed large and included, as A4NR’s
20 testimony pointed out, the failure of PG&E to (1) complete updated studies of DCNPP’s seismic setting and
21 vulnerabilities and (2) address the regulations pending adoption by the State Water Resources Control
22 Board restricting the use of marine waters by power plants for once-through cooling. Even if submitting a
23 flawed economic analysis as part of the *Renewal Cost Application* could be construed to be a good faith
24 attempt on PG&E’s part to comply with the Commission’s orders, the ultimate dismissal of the *Renewal*
25 *Cost Application* on procedural grounds precludes the Commission from finding that PG&E has met the

originally protested the *Renewal Cost Application*, which were submitted in the *Protest of the Alliance for Nuclear Responsibility, Sierra Club, CalPIRG, Environment California Research and Policy Center to Pacific Gas and Electric Company’s Application to Recover the Costs Associated with Renewal of the Diablo Canyon Power Plant Operating Licenses*, Application 10-01-022, March 10, 2010.

³¹ See *Decision Granting Motion to Dismiss the Application of Pacific Gas and Electric Company, id.*, printed opinion at pp.4 to 5, citing Public Utilities Code Section 1705(a).

³² *PG&E Test Year 2007 General Rate Case, id.*, printed opinion at p.103.

³³ *Joint Motion re Renewal Cost Application Settlement*, at p.4.

1 terms of the Commission's orders in the *PG&E Test Year 2007 General Rate Case*. A4NR and SLOMFP
2 recommend the Commission enforce its prior orders by denying rate recovery for any of PG&E's costs of
3 seeking license extensions for the DCNPP units.

4 Second, PG&E's request for rate recovery of its license-renewal costs flies in the face of the utility's
5 explicit recognition that it would be defying the Commission's order by making its NRC filing in advance of
6 making the requisite demonstration as to the cost-effectiveness of keeping DCNPP in its resource portfolio.
7 PG&E decried the notion raised by A4NR that the utility would treat approval of the license extension
8 feasibility study as a *de facto* approval of an NRC filing and invited the Commission to resort to the "ample
9 means" at its disposal in the event of such an unlikely outcome. PG&E clearly understood the hurdles it
10 needed to overcome before recovering its costs of pursuing the DCNPP license extensions and chose to
11 ignore them. A4NR and SLOMFP are unaware of the full range of the "ample means" that might be
12 brought to bear against a utility acting in defiance of a Commission order, but at the very least the
13 consequences should include requiring the utility, and not its customers, to bear the costs that are the
14 direct product of such actions. A4NR had explicitly raised this point throughout the ill-fated *Renewal Cost*
15 *Application* proceedings, adding to the proofs that PG&E was well aware of the regulatory risks it was
16 facing by acting precipitously and in advance of Commission approvals. Without arguing that PG&E
17 intended to mislead the Commission in the *PG&E Test Year 2007 General Rate Case* or *Renewal Cost*
18 *Application* filings, A4NR and SLOMFP believe the Commission should insist on holding the regulated
19 utilities to their spoken and written word and, here, the Commission should do that by invoking the "ample
20 means" of disallowing PG&E's license-renewal costs from rate recovery.

21 Had PG&E decided to subject its license-extension feasibility study and its economic analysis of
22 DCNPP's future value as a long-term resource to a full review by the Commission prior to filing its NRC
23 application, the March 2011 Tohoku seismic event and failure of the Fukushima Daiichi units no doubt
24 would have, independently and somewhat serendipitously, resulted in PG&E never making any NRC filing
25 or incurring any costs for license renewal at all. That is, if PG&E had complied with the Commission's
26 directions and requested authority to make its NRC filing as part of its *Renewal Cost Application*, that
27 request would have been pending Commission disposition at the time of the Tohoku seismic event. The
28 seismic issues implicated and under NRC investigation for all U.S. nuclear plants, and west coast plants in
29 particular, would have in all likelihood been fatal to PG&E's request. PG&E would have been saved the
30 time and expense for the NRC proceeding had the utility only followed the clear regulatory directions issued
31 by this Commission.

1 None of PG&E's actions nor the consequences for cost recovery can be saved by referencing the
2 self-imposed time constraints PG&E faced through its participation in the STARS consortium. PG&E
3 alleged in the *Renewal Cost Application*, and repeats the allegation in this proceeding, that the timing of its
4 NRC filing was dictated by the "slot" assigned to DCNPP by PG&E's STARS cohorts. The NRC has
5 advised A4NR that any agreement among the STARS members had absolutely no effect on the NRC's
6 willingness to accept or process license-extension applications from any STARS member in general or
7 PG&E specifically. PG&E has admitted to A4NR that PG&E could have filed the license-extension
8 application at any time of their choosing and was not constrained to filing in accordance with the STARS-
9 determined filing "slot." PG&E has further admitted to A4NR that any implication that the STARS-
10 determined slot they used to time their application was mandatory is simply untrue.³⁴ To the contrary, filing
11 the NRC application was a matter of PG&E exercising unfettered management discretion. Thus, filing with
12 the NRC in November 2009, in advance of seeking and receiving the approval of this Commission for any
13 such filing, was a matter of PG&E's wholly unconstrained choice. This Commission could have reviewed
14 PG&E's January 2010 *Renewal Cost Application* in plenty of time for PG&E to receive its NRC approvals
15 (or rejections) well in advance of the expiration of the DCNPP licenses.

16 A4NR and SLOMFP also dispute the notion posed by PG&E that the utility needed to file its NRC
17 application in advance of further Commission actions in order to provide PG&E with sufficient time in which
18 to start the process of replacing DCNPP capacity and energy if either (a) the NRC rejected the license-
19 extension application or (b) this Commission decided relicensing was a suboptimal resource decision. The
20 timing of the Joint Proposal (June 2016) and the provisions describing the timing and scale of the
21 replacement procurements PG&E will conduct to replace DCNPP capacity and energy demonstrate PG&E
22 has more than sufficient time in which to address any supply-demand imbalances posed by DCNPP's
23 retirement, now a mere seven to eight years away. Furthermore, if PG&E needed a Commission decision
24 on whether to proceed with license renewals or retire and replace DCNPP no later than 2014, then PG&E
25 should now be deemed to have unreasonably and imprudently delayed its decision to retire and replace
26 DCNPP until June 2016. At minimum, PG&E's position would at best only support the reasonableness of
27 costs, both out-of-pocket and AFUDC, incurred through 2013. If 2014 was such an important "drop-dead
28 date," PG&E should have enforced its own analysis (and rhetoric) by terminating the NRC proceeding once
29 2013 had passed. Once again, PG&E might have avoided all of the costs, or at least a good portion of the

³⁴ PG&E Response to A4NR Data Request 1.29, Application 16-08-006, September 29, 2016.

1 costs, of seeking DCNPP license extensions had it simply complied with the Commission's orders to
2 demonstrate DCNPP's economic value in advance of filing for license extensions with the NRC.

3 **c. PG&E's Failure to Demonstrate the Reasonableness of License Renewal Costs**

4 Even if the Commission were to turn a blind eye to PG&E's failure to comply with the terms of the
5 Commission's orders in the *PG&E Test Year 2007 General Rate Case*, and A4NR believes ignoring such
6 conduct would violate public policies supporting the enforcement of the integrity of the Commission's
7 processes and orders, PG&E has failed to demonstrate that any portion of the \$52.7 million in license-
8 renewal costs it seeks to recover are reasonable. PG&E's case-in-chief only demonstrates that it has
9 incurred costs, some out-of-pocket and some the product of financial and regulatory accounting practices,
10 and spending alone is not entitled to some presumption of reasonableness as a matter of factual inference,
11 law or policy.

12 Given the Commission's early concerns that the prudence of pursuing license extensions for
13 DCNPP was a matter for future demonstration and determination, PG&E should have, but has not even as
14 of today, provided proof that those costs were prudently incurred from the date of the NRC filing and/or
15 were thereafter strictly managed. In addition to PG&E's failure to demonstrate the prudence of its actions
16 and the reasonableness of its costs, there are facts and inferences demonstrating that PG&E was
17 imprudent in initiating the NRC license-renewal process and in failing to terminate the NRC proceedings in
18 a timely manner prior to June 2016.

19 **1. The Flawed *Renewal Cost Application* Economic Analysis**

20 PG&E submitted an economic analysis of DCNPP's future value as part of the ill-fated *Renewal*
21 *Cost Application*. That analysis provides contemporaneous evidence as to why PG&E believed it was
22 prudent in making its 2009 NRC filing for the DCNPP license extensions. But, as noted previously, the
23 merits of that analysis were contested and, as part of the three-party settlement in the *Renewal Cost*
24 *Application* proceeding, PG&E agreed the economic analysis should be updated, augmented and
25 submitted for Commission review as part of the company's next general rate case. Thus, while PG&E's
26 economic analysis concluded that extending the DCNPP licenses for an additional twenty (20) years would
27 result in customer benefits of between \$3.5 billion to \$16 billion, PG&E's agreement to the terms of the
28 settlement describing the deficiencies of that analysis cannot support any inference that the results of the
29 analysis were credible. A review of the methods and assumptions used in the economic analysis provide

1 further evidence that those results were not credible and cannot be used to justify PG&E's decision to
2 proceed with the NRC filing in advance of Commission authority to do so.

3 (a) The Flawed Forecasts of the Costs of DCNPP Operations

4 PG&E's economic analysis was based, in part, on a forecast of DCNPP's costs of operations for
5 the period 2010 through 2044. Separate forecasts were made for non-fuel operating costs, capital
6 expenditures and fuel costs. A single year-by-year forecast for each of these components was aggregated
7 into an annual revenue requirement. The sum of the annual revenue requirements for the period 2025 to
8 2044 was then compared to the costs of potential resource alternatives that might be available to replace
9 DCNPP capacity and energy in the event DCNPP was retired upon the expiration of the facility's current
10 licenses. This methodology and the assumptions used in the analysis bear significant flaws.

11 First, PG&E relied on a single-point forecast for each of the three components used to develop
12 DCNPP operating costs. PG&E had been criticized in both the *PG&E Test Year 2007 General Rate Case*
13 and in the *Renewal Cost Application* for significantly underestimating DCNPP operating costs. In the face
14 of these criticisms, PG&E should have analyzed the economic value of extending the DCNPP licenses
15 using a range of DCNPP costs under various economic and regulatory conditions rather than a single-point
16 forecast. This would have been even more prudent in light of the fact that, as reflected in the assumptions
17 used to develop the range of costs associated with the resource alternatives to which DCNPP's operating
18 costs were compared, PG&E's study incorporated any number of variables describing conditions of severe
19 economic distress, e.g., extraordinarily high costs of natural gas fuels, that rendered the comparison
20 between DCNPP's forecasted steady-state costs and the extreme fluctuations in the costs of alternative
21 resources meaningless.

22 Second, PG&E's DCNPP cost forecast omitted various costs from the annual revenue requirement
23 for post-2024 operations, biasing the results of the *Renewal Cost Application* economic study in favor of
24 license renewal. For example, under an assumption that DCNPP would operate beyond 2024, PG&E
25 should have adjusted its recovery of the net capital investment remaining in the DCNPP assets to reflect a
26 remaining service life of thirty-four (34) years; instead, the *Renewal Cost Application* economic analysis
27 assumed that all remaining DCNPP net investment had been completely depreciated and recovered at a
28 time coincident to the expiry of DCNPP's existing operating licenses in 2024 and 2025. Given that
29 DCNPP's remaining net capital investment was at the time (and to this day remains) in excess of \$2 billion,
30 a change to the capital-recovery schedule would have increased DCNPP revenue requirement by more
31 than \$100 million annually and by more than \$2 billion across the 2025-2044 period of the license

1 extensions. Taking this single adjustment into account, the lower end of the range of “savings” PG&E was
2 predicting customers would receive during the twenty-year license-extension period would have fallen by
3 nearly sixty percent (60%) and the upper end by more than twelve percent (12%).

4 Third, PG&E’s DCNPP cost forecast omitted any consideration of known variables which would
5 have a direct, and potentially significant, deleterious effect on the costs of DCNPP’s long-term cost-
6 effectiveness. In March 2008, the State Water Resources Control Board (“SWRCB”) announced plans to
7 consider adopting severe restrictions on the use of marine and estuarine waters for once-through cooling at
8 future and existing power plants pursuant to its authorities under the federal Clean Water Act. Although
9 these restrictions would have implications for DCNPP operations and costs, the *Renewal Cost Application*
10 economic analysis made no mention of these new policies or the potential effects they would have on
11 DCNPP’s cost-efficacy, including the costs of replacement power that might need to be procured in the
12 event DCNPP needed to undergo significant reconfiguration or reconstruction to meet the SWRCB’s final
13 requirements.³⁵ Additionally, the NRC has a history of continuously updating federal design, construction,
14 operations, and maintenance standards; meeting the terms of new regulations is a significant driver of
15 incremental costs to nuclear power plants, including DCNPP. The *Renewal Cost Application* economic
16 analysis completely ignored the effect of NRC “regulation creep” in its estimates of DCNPP operating costs,
17 although this effect is always a routine feature of DCNPP costs included as part of PG&E general rate

³⁵ The SWRCB adopted December 31, 2024, as the date by which DCNPP must comply with the new restrictions. As noted in PG&E’s application, it is possible that the mitigation measures now under study and consideration by the SWRCB for DCNPP may be cost-prohibitive, adding additional impetus for DCNPP’s retirement in 2024 and posing the potential for the retirement of DCNPP Unit 2 at a time prior to the expiration of that unit’s NRC operating license. Under the SWRCB’s rules, power plant owners may comply with the once-through cooling restrictions by retiring their plants, the strategy which appears to be the one PG&E will follow for DCNPP.

1 cases.³⁶ The omission of these important factors was a methodological flaw in the DCNPP cost data upon
2 which the *Renewal Cost Application* economic analysis relied.³⁷

3 Fourth, PG&E's forecast of annual DCNPP operating costs were grossly erroneous. The following
4 table compares the forecast of operating costs used in the *Renewal Cost Application* economic analysis
5 with DCNPP's actual costs of operation and more recent forecasts submitted by PG&E:

³⁶ PG&E concedes the point in its Joint Proposal prepared direct testimony, noting that controlling nuclear operating costs represented one of the four significant planning challenges presented by DCNPP operations. (See *Pacific Gas & Electric Company: Retirement of Diablo Canyon Power Plant, Implementation of the Joint Proposal, and Recovery of Associated Costs through Proposed Ratemaking Mechanisms – Prepared Testimony*, Chapter 2 (Frazier-Hampton), at pp.2-22 to 2-23; also, *PG&E Response to A4NR Data Request 1.5*, Application 16-08-006, September 12, 2016.) Even if the 1.8-percent escalation factor used in the long-term forecast of operating expenses found in the *Renewal Cost Application* economic analysis (discussed below) arguably covered “reasonably foreseeable” labor escalation and inflation (and it proved inadequate in actuality), this value for escalation could not possibly be argued to cover the increasing costs of regulatory compliance and real growth in costs. This is a critical point: the influence of the NRC on DCNPP operating costs is well-exemplified by the fact that, during the pendency of the *Renewal Cost Application*, the Tohoku earthquake and tsunami events resulted in the closure of the Fukushima Daiichi plants in Sendai, Japan, causing the NRC to react by opening an inquiry into the “lessons learned” that might be applied to domestic nuclear power plants. The breadth of the NRC inquiry gave PG&E good reason to suspend the *Renewal Cost Application* proceeding and license-renewal proceeding before the NRC. Importantly, PG&E has since recognized the potential for the NRC inquiry to result in cost increases of such magnitude that they would overwhelm PG&E's ability to address them through corporate-wide budget management, and implemented a new balancing account that would allow PG&E to pass NRC-related cost increases on to its electric customers.

³⁷ Interestingly, the one “high-level” sensitivity tested in the *Renewal Cost Application* economic analysis is the effect that a decline in plant performance would have on DCNPP's long-term cost-effectiveness. The analysis included sensitivity scenarios where DCNPP output would fall to an eighty-five-percent (85%) capacity factor, the industry average over the prior seventeen (17) years, a decline from the ninety-percent (90%) capacity factor reflected in the base cases. The lower output range would reduce twenty-year cost-effectiveness results in the *Renewal Cost Application* economic analyses by a little less than \$100,000,000.

**Table A4NR-1
DCNPP Operating Costs
2010 to 2019**

(Millions of Nominal \$)

(a) Year	(b) <i>Renewal Cost Application Study</i>	(c) Recorded Costs	(d) Updated PG&E Forecasts	(e) Variance	
				\$	%
2010	297.4	296.2		(1.2)	(4.0)
2011	334.2	325.8		(8.4)	(2.5)
2012	347.7	366.5		18.8	5.4
2013	353.3	362.9		9.6	2.7
2014	398.3	404.2		5.9	1.5
2015	363.9		404.4	40.5	11.1
2016	359.5		417.2	57.7	16.1
2017	370.4		425.7	55.3	14.9
2018	377.2		≈437.4	60.2	16.0
2019	433.0		≈495.4	62.4	14.4
2020	390.9		≈461.8	70.9	18.1

Column (b) taken from *Renewal Cost Application* economic study, A.10-01-022. Column (c) 2010 to 2013 recorded costs from A.15-09-001 (*PG&E Test Year 2017 General Rate Case*), Exhibit (PG&E-5 WP), p.WP3-1; 2014 recorded costs from A.15-09-001 (*PG&E Test Year 2017 General Rate Case*), Exhibit (PG&E-1 WP, p.1-175). Column (d) 2015 to 2017 forecasts from A.15-09-001 (*PG&E Test Year 2017 General Rate Case*), Exhibit PG&E-5, at p.3-50; 2018 to 2020 forecasts escalated at 2.75% per annum from prior year using average of proposed Electric Generation supply and material escalation factor (2.46%) and labor escalation factor 2.9%) submitted by PG&E in A.15-09-001 (*PG&E Test Year 2017 General Rate Case*); 2019 forecast includes costs of second refueling of \$46 million.

The foregoing table reveals the degree to which the *Renewal Cost Application* economic analysis relied upon assumptions which proved to understate DCNPP's costs of operations significantly – an obvious material divergence between the *Renewal Cost Application* assumptions and recorded costs begins in 2012. The difference results in a considerable bias favoring the cost-effectiveness of the license-extension option. Equally important is that this bias echoes throughout the post-2017 period represented in the *Renewal Cost Application* economic analysis. The *Renewal Cost Application* forecast of DCNPP operating costs for the period 2018 to 2044 was based upon 2017 operating costs, escalated by a constant factor of 1.8 percent per annum. As early as 2012, neither PG&E's recorded operating costs nor more recent, updated cost forecasts provided any basis for concluding that prior-year results of operations were reflective of future cost escalation, or that PG&E had the ability to manage these costs within budget, or that the 1.8-percent escalation factor bore any resemblance to reality. If, for example, the escalation factor were changed to four percent (4%) as shown in Table 2 below, the DCNPP operating costs during the period 2025 to 2044 would increase from \$10,596.0 million to \$15,364.1 million. Taken alone, this increase

1 would reduce the twenty-year net economic benefit PG&E submitted in the *Renewal Cost Application*
 2 economic analysis from a range of \$3.5 billion to \$16 billion to a range of negative \$2 billion to a positive
 3 \$10.5 billion:

4 **Table A4NR-2**
 5 **DCNPP Operating Costs**
 6 **2010 to 2019**

7 (Millions of Nominal \$)

Year	<i>Renewal Cost Application Study</i>	Costs at 4 Percent Annual Escalation
2025	427.3	506.9
2026	435.0	527.2
2027	442.9	548.3
2028	450.8	570.2
2029	517.5	651.6
2030	467.2	616.7
2031	475.6	641.4
2032	484.2	667.1
2033	492.9	693.8
2034	565.8	785.5
2035	510.8	750.4
2036	520.0	780.4
2037	529.4	811.6
2038	538.9	844.1
2039	618.6	947.8
2040	558.5	912.9
2041	568.5	949.4
2042	578.8	987.4
2043	589.2	1,026.9
2044	676.3	1,144.5
Total	10,596.0	15,364.1

8 Substituting an escalation factor of 3.5 percent would have reduced the lower-end net benefit forecasted by
 9 the *Renewal Cost Application* (i.e., \$3.5 billion for the period 2025 to 2044) economic analysis to zero.
 10 Furthermore, updating the forecasted 2017 costs to reflect the value presented in the *PG&E Test Year*
 11 *2017 General Rate Case* (a forecast PG&E developed in early 2015), would have (a) cut the twenty-year
 12 net benefit projections in the *Renewal Cost Application* economic analysis by \$1.1 billion even using the
 13 unrealistic and ill-chosen 1.8-percent escalation factor and (b) reduced the lower-end net benefit to zero
 14 under a 2.5-percent escalation factor, a value *below* the DCNPP attrition escalators pending adoption in the
 15 *PG&E Test Year 2017 General Rate Case*.

1 Given the obvious sensitivity of the benefit projections presented in the *Renewal Cost Application*
2 to changes in assumptions for operating costs and escalation, PG&E's economic analysis should have
3 included an analysis of the vulnerability of the value of DCNPP license extensions to forecast error in these
4 assumptions, *but no such analysis was performed*. Had the Commission considered and affirmed the
5 reasonableness of what proved to be specious cost assumptions, PG&E might have been provided with
6 some basis upon which to assert that reliance on those assumptions, as bad as they were, still justified the
7 commencement of the NRC process for the DCNPP license extensions. But the cost assumptions were
8 never tested or approved in any Commission proceeding, and historical operations and updated forecasts
9 combine to demonstrate conclusively that PG&E's economic case was fragile from the beginning and
10 deteriorated with each passing year. By neglecting to seek and obtain the Commission's approval of the
11 decision to initiate the NRC license-extension proceeding in the face of demonstrably inadequate analyses,
12 PG&E acted imprudently in commencing the NRC process and thereafter failed to act reasonably in
13 pursuing the DCNPP license extensions as the inaccuracies in the operating-cost assumptions revealed
14 themselves.

15 Fifth, an equally material bias favoring DCNPP's cost-effectiveness can be found in the
16 assumptions used in the *Renewal Cost Application* economic analysis for annual capital expenditures. The
17 following table compares the forecast of operating costs used in the *Renewal Cost Application* economic
18 analysis with recorded and updated forecasts for DCNPP capital expenditures and reveals that the forecast
19 consistently understated recorded capital investment, rendering the veracity of the forecast of annual
20 capital expenditures suspect:

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**A4NR Table 3
DCNPP Capital Expenditures
2010 to 2019**

(Millions of Nominal \$)

Year	Renewal Cost Application Study (b)	Recorded Capital Additions (c)	Updated PG&E Forecasts (d)
2010	195.5	175.0	
2011	165.3	233.5	
2012	183.3	263.6	
2013	156.5	220.8	
2014	182.1	217.3	
2015	154.6	224.1	
2016	117.4		213.9
2017	176.1		159.7
2018	220.7		137.7
2019	151.1		150.1

Column (b) taken from *Renewal Cost Application* economic study, A.10-01-022. Column (c) 2010 to 2014 from A.15-09-001 (*PG&E Test Year 2017 General Rate Case*), Exhibit (PG&E-5), p.WP3-103, Table 003-1, 2015 from A.15-09-001 (*PG&E Test Year 2017 General Rate Case*), Exhibit ORA-12, p.24, Table 12-10. Column (d) 2016 to 2019 forecasts from A.15-09-001 (*PG&E Test Year 2017 General Rate Case*), Exhibit PG&E-5, at p.3-9 (note: post-2015 forecasts reflect significant declines in capital costs subject to rate recovery under the terms of the PG&E NRC Regulatory Balancing Account; actual capital costs subject to true-up under the terms of the NRCRBA tariffs).

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For the years 2016 through 2044, the *Renewal Cost Application* economic analysis goes on to assume capital additions will ramp down to \$100 million per year (in 2009\$) by 2016,³⁸ and thereafter remain constant (in 2009\$) through 2040, at which time capital additions will ramp down to \$25 million in 2044. This assumption does not comport with a historical review of actual DCNPP capital investment experience. PG&E invested \$2.045 billion in nuclear-generation plant over the period January 1, 2002, through December 31, 2014, an annual average of \$157 million.³⁹ Given the level of historical capital investments required to operate DCNPP reliably and safely and maintain compliance with ever-changing NRC regulations, PG&E had little reason to believe that DCNPP capital requirements could be held constant at any level from year to year, let alone at a figure well below historical averages.

³⁸ Abnormal capital investments for betterment projects and the Independent Spent Fuel Storage Installation included in the *Renewal Cost Application* study for 2017 through 2018 obscure the effect of this assumption.

³⁹ See *PG&E Test Year 2017 General Rate Case*, Application 15-09-001, Exhibit PG&E-10, p.11-3. This additional investment brought the total original cost of PG&E’s nuclear generation plant to \$7.3 billion as of December 31, 2014. An additional \$461 million has been invested in DCNPP-related transmission plant.

1 The effect of understating annual DCNPP capital additions has a dramatic impact on the results of
2 the *Renewal Cost Application* economic analysis. Assuming for the sake of argument that PG&E could
3 hold its annual base capital investment in DCNPP constant at the post-2002 historical level of \$150 million
4 rather than the optimistic \$100 million level used in the PG&E analysis, DCNPP investment for the period
5 2016 to 2044 would increase by more than \$1.3 billion compared to the values used in the *Renewal Cost*
6 *Application* economic analysis. Assuming (a) a rate of return of 8.9 percent and (b) a net-to-gross multiplier
7 of 1.80 for income taxes, the incremental revenue requirement to cover this increase to DCNPP investment
8 would be approximately \$2.4 billion for the period 2025 to 2044.⁴⁰ This would considerably narrow the net
9 economic benefit calculated under the *Renewal Cost Application* economic analysis. If added to the
10 previously discussed (a) \$2 billion increase to DCNPP revenue requirement related to a change in the
11 capital-recovery schedule for pre-2016 DCNPP net investment and (b) the \$5 billion increase to operating
12 expense derived using a four-percent cost escalator, the change in assumptions for annual capital
13 additions would raise total DCNPP costs by some \$9.5 billion compared to the cost forecasts used in the
14 *Renewal Cost Application* economic analysis. Under the foregoing changes to the *Renewal Cost*
15 *Application* study assumptions, extending DCNPP operations through 2044 would have been an extremely
16 unattractive resource option compared to most of the options evaluated in the *Renewal Cost Application*
17 economic analysis. Once again, given the obvious sensitivity of the results of the *Renewal Cost Application*
18 economic analysis to DCNPP cost assumptions, PG&E should not have initiated NRC proceedings without
19 this Commission's approval given the inconclusive and demonstrably weak results provided by that
20 analysis.

21 **(b) Market Forces and the Costs of Alternative Resources**
22 The PG&E *Renewal Cost Application* economic analysis compared a small set of discrete
23 replacement energy sources to meet PG&E system electricity needs as an alternative to extending DCNPP
24 operations for an additional twenty 20 years beyond the plant's existing reactor licenses. The alternatives
25 considered were: (i) gas-fired combined-cycle generation; (ii) energy efficiency; (iii) renewables; (iv) coal-
26 based gasification integrated with combined-cycle generation and carbon capture and sequestration; and,

⁴⁰ This figure disregards the differences between the forecast values used for capital additions in the *Renewal Cost Application* economic analysis for the years 2010 through 2016 and recorded values for those same years. Using the recorded values from those years would result in an even greater decrement to the *Renewal Cost Application* projected net economic benefit arising from DCNPP license extensions.

1 (v) combined heat and power generation.⁴¹ Importantly, PG&E did not attempt to optimize a blend of
2 alternatives in their study, but merely examined individual alternatives as stand-alone options. A more
3 robust approach would have been to include all available power replacement alternatives in a simulation
4 and perform sensitivity analyses to find the optimum solution, which is essentially the approach taken in the
5 determining the basket and timing of replacement resources recommended by the Joint Proposal.

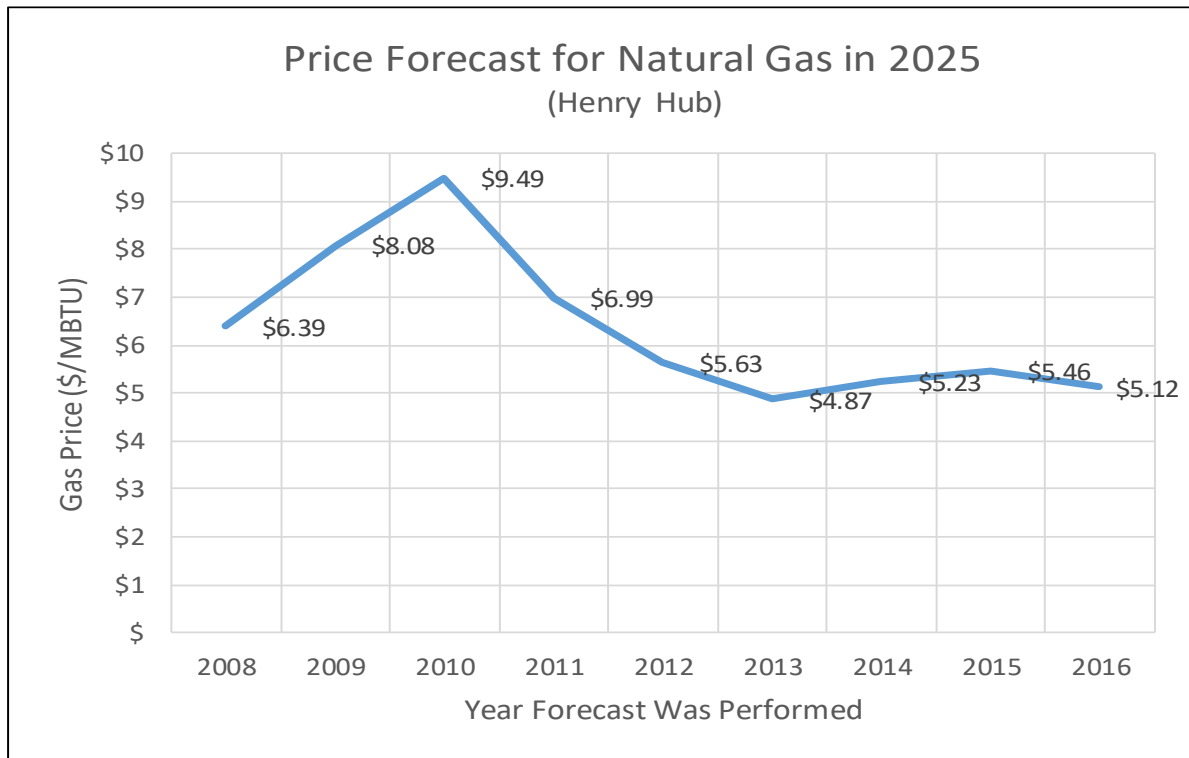
6 While A4NR and SLOMFP agree it was important to analyze alternatives to the status quo to
7 ensure ratepayer benefits were maximized, A4NR and SLOMFP also believe that, for a project of this
8 magnitude, the study should have been much more robust and comprehensive and, equally important,
9 needed to be reevaluated on an ongoing basis to verify that the study conclusions remained valid. This is
10 especially true when significant or unanticipated changes occur in the energy markets. Not only was the
11 2010 *Renewal Cost Application* study PG&E used as a basis to justify moving forward with the relicensing
12 effort flawed, but PG&E was remiss in not reevaluating its conclusions on a regular basis. Rather, PG&E
13 waited until mid-2016 to determine that the relicensing effort was no longer in the best interest of the
14 company or the ratepayers. In fact, as early as 2011, a matter of a few months after the *Renewal Cost*
15 *Application* was filed, it was readily apparent that many of the assumptions used in the *Renewal Cost*
16 *Application* study were outdated and significantly misaligned with changes that had occurred in the
17 California energy market.

18 As noted above, the *Renewal Cost Application* economic study compared the costs of extending
19 DCNPP operations to replacing the facility with a natural-gas-fired combined-cycle unit. Because the
20 comparison technology offers relatively low fixed costs and relies on natural gas as the fuel source, the
21 Levelized Cost of Energy (“LCOE”) for this option is highly dependent on the cost of natural gas – as much
22 as two-thirds of the LCOE for this option is determined by fuel costs.⁴² At the time PG&E conducted the
23 *Renewal Cost Application* economic study (circa 2009), fossil fuel prices were at the peak of a trend of
24 historically high prices, and forecasts for natural gas prices anticipated a continuation of these high prices
25 for the foreseeable future. Although the combined-cycle option was the lowest cost alternative in PG&E’s
26 study, the extraordinarily high fuel prices forecasted at the time of the study caused the combined-cycle
27 option to appear uncompetitive when compared to the costs of extending the DCNPP operating licenses.

⁴¹ Of these alternatives, PG&E dismissed the combined heat and power generation option because it would be extremely challenging to implement; as a result, the option was not included in their analysis of alternatives.

⁴² See the Energy Commission’s report issued contemporaneously with PG&E’s *Renewal Cost Application* economic analysis, “Comparative Costs of California Central Station Electricity Generation”, January 2010, at pages A-6, B-2, and B-3. See <http://www.energy.ca.gov/2009publications/CEC-200-2009-017/CEC-200-2009-017-SF.pdf>.

1 The flaws in this comparison were exacerbated by the study's approach, which used a single, unreasonably
2 low cost estimate for DCNPP operating costs (see discussion above) while using a range of prices (high
3 and low) for the combined-cycle alternatives. Regardless of the flaws in the initial analysis, by the following
4 year (2011) fossil fuel spot prices and related forecast prices for natural gas had plummeted, as shown in
5 the following chart:
6



7
8 The chart above presents the forecasted price for natural gas (\$/MBTU at Henry Hub) for delivery in year
9 2025, as performed each year by the U.S. Energy Information Administration.⁴³ From a 2010 perspective,
10 when PG&E released its study, forecasted prices for natural gas in 2025 were expected to be extremely
11 and disruptively high. Given the contemporaneous history of price and forecast escalation, it may have
12 appeared reasonable that gas prices could stay high or possibly trend higher still. However, by 2011, only
13 one year later, the price forecast for 2025 gas was down by twenty-six percent (26%).⁴⁴ Similar results for
14 years 2030 and 2035 show a reduction in forecasted gas prices of thirty-three percent (33%) and forty
15 percent (40%), respectively.⁴⁵ Certainly PG&E, as one of the largest natural gas buyers in the country, was

⁴³ U.S. Energy Information Administration, Energy Outlook with Projections, Years 2008-2016, Table A1- Reference Case (Natural Gas at Henry Hub).

⁴⁴ *Id.*

⁴⁵ *Id.*

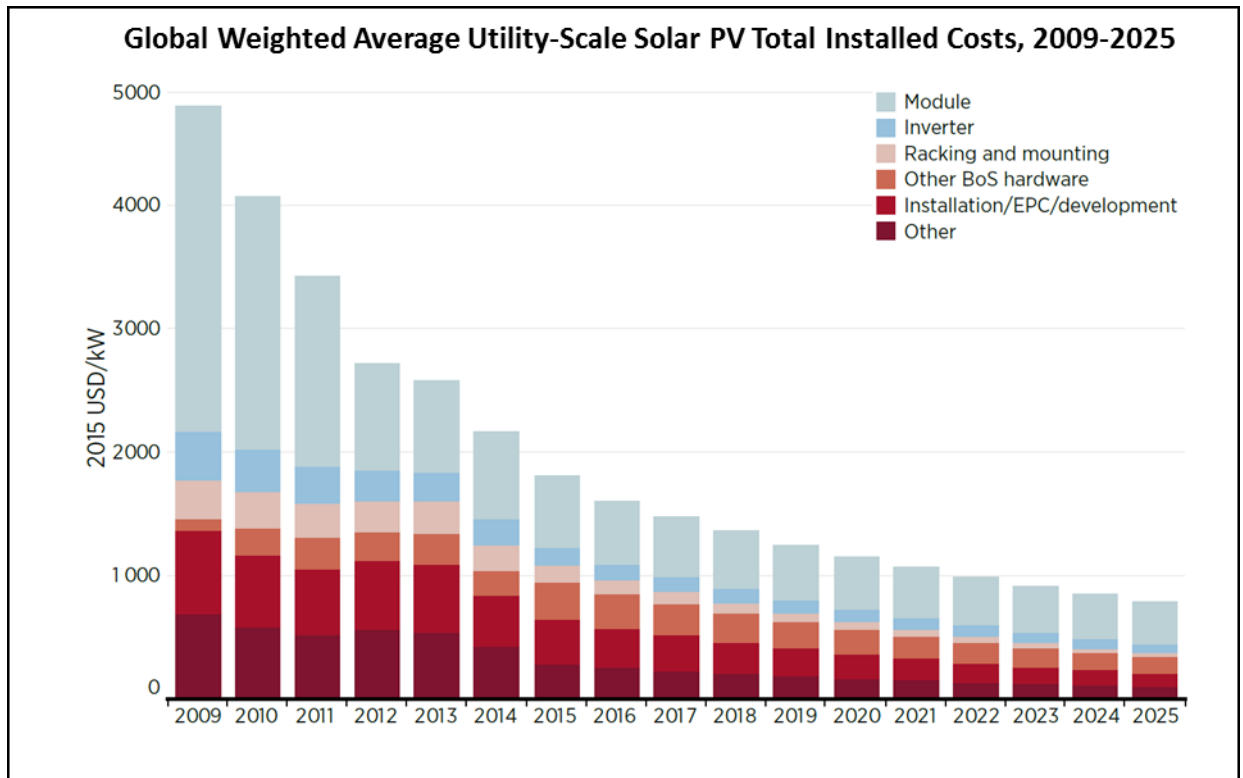
1 fully aware of these dramatic changes in market prices and price forecasts. PG&E should have been
2 immediately prompted to reevaluate the impact of these changes on the cost to provide replacement
3 energy for DCNPP. As noted previously, with fuel costs constituting more than half of the LCOE basis for
4 the combined-cycle alternative, the cost of electricity generated under this option would have been
5 expected to decrease by thirteen percent (13%), sixteen percent (16%), and twenty percent (20%) for years
6 2025, 2030, and 2035, respectively, based on the 2011 forecasts. The precipitous decline in forecast
7 prices for natural gas continued for two more years, until 2013, when gas forecast prices eventually
8 stabilized at levels forty-nine percent (49%), fifty-six percent (56%), and fifty-eight percent (58%) lower,
9 respectively, for years 2025, 2030, and 2035, than was predicted in 2010, the year the *Renewal Cost*
10 *Application* study was released – the decrease in fuel costs alone result in an LCOE of as much as twenty-
11 seven percent (27%) lower than predicted in the *Renewal Cost Application* economic study. This is
12 significant not only because of the large drop in price for this fuel, but also because of the impact the
13 change could be expected to have on the entire California energy market, since nearly half of California's
14 electricity generation is fueled by natural gas. A4NR and SLOMFP believe PG&E, with its intimate
15 knowledge of gas pricing and fuel markets, should have acted prudently and responded to this monumental
16 sea change in gas prices by reevaluating the combined-cycle generation alternative included in the
17 *Renewal Cost Application* economic study as soon as it became apparent that fuel prices had turned
18 around, and certainly no later than by mid-2011. While fuel prices alone may not have been sufficient to
19 cause PG&E to reconsider the DCNPP relicensing effort, when viewed in light of all the other challenges
20 PG&E faced in relicensing the plant noted in this testimony, such as regulatory, political, and new seismic
21 concerns, PG&E should have come to the conclusion that extending the license was not in the best interest
22 of customers or the company prior to June 2016, well before relicensing costs reached \$52.7 million.

23 In addition to the changes in natural gas prices discussed above, solar photovoltaic (“PV”) prices
24 were on the cusp of a precipitous drop accompanied by a sustained downward price trend at the time that
25 PG&E performed the *Renewal Cost Application* economic study. These cost reductions were due largely to
26 advancements in technology, marketplace competition and economies-of-scale achieved due to the
27 ramping up of the production of PV panels, all of which were the result of demand caused by regulatory
28 requirements and incentives. The graph below⁴⁶ depicts global weighted average utility-scale solar PV total
29 installed and forecasted costs across the period 2009 to 2025 and illustrates that capital costs for solar

⁴⁶ http://www.irena.org/DocumentDownloads/Publications/IRENA_Power_to_Change_2016.pdf. International Renewable Energy Agency, “The Power to Change: Solar and Wind Cost Reduction Potential to 2025.”

1 installations dropped on the order of eighteen percent (18%) per year during the period 2009 to 2012. This
 2 downward price trend continues through today and the downward trajectory is forecasted to continue
 3 through 2025, when DCNPP would either be relicensed or retired and replaced with alternative sources.
 4 The graph indicates that capital costs for solar PV are expected to decline by approximately eighty-four
 5 percent (84%) between 2009 and 2025. Additionally, according to Solar Power World⁴⁷, by 2015, most
 6 purchased power agreements sampled were priced at or below \$50 per megawatt-hour on a levelized
 7 basis, with a few priced as aggressively as about \$30 per megawatt-hour, indicating that the price decline is
 8 not just speculative, but represents real pricing incorporated into executed contracts. At these price points,
 9 power from solar PV is competitive with even the questionable baseline DCNPP operating costs used in the
 10 *Renewal Cost Application* economic study for the license-extension period.

11

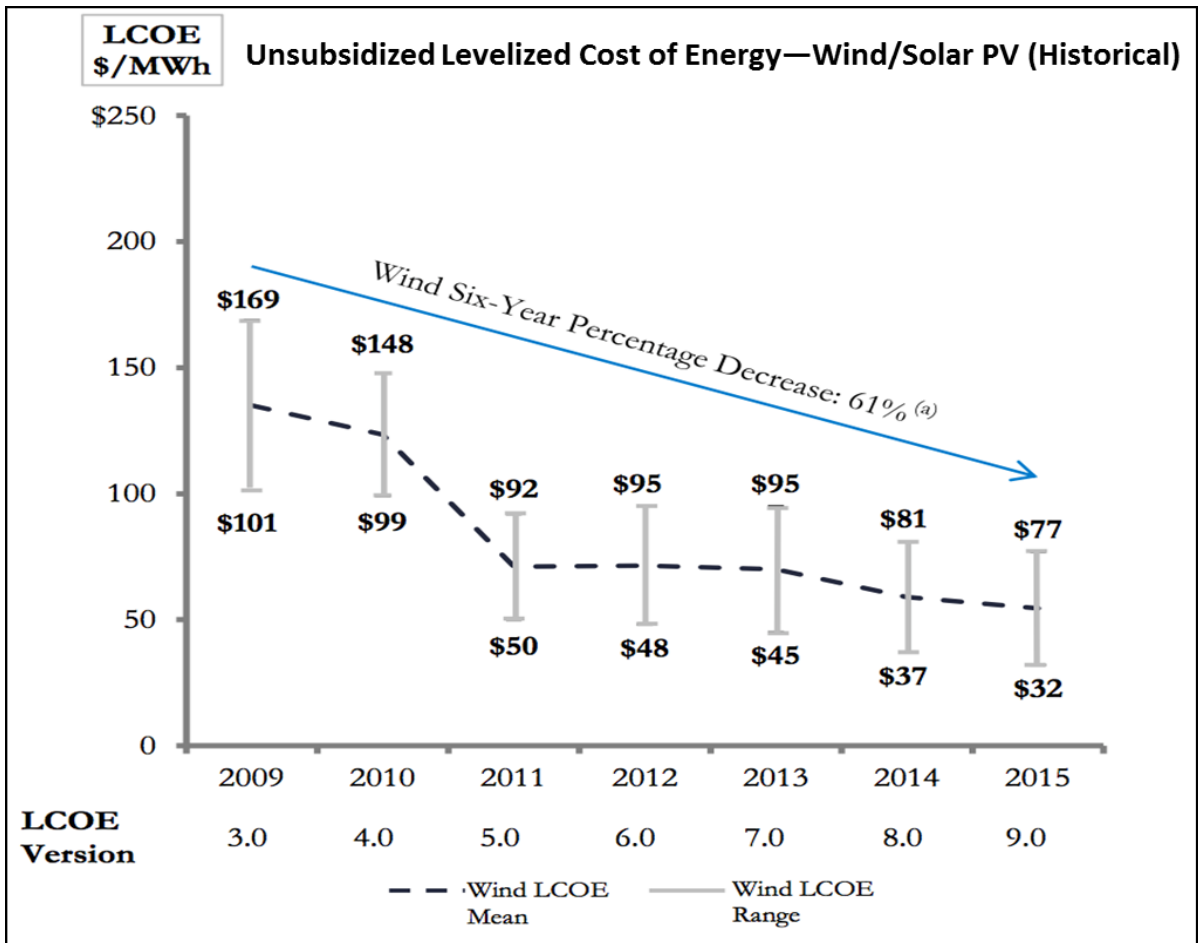


12

13 Similarly, costs for wind-sourced power responded to the same market stimuli affecting solar PV
 14 prices, resulting in a reduction in wind-sourced LCOE by approximately sixty-one percent (61%) during the
 15 period from 2009 through 2015, as illustrated in the graph below:⁴⁸

⁴⁷ <http://www.solarpowerworldonline.com/2016/08/berkeley-lab-finds-utility-solar-prices-fell-12-last-year/>.

⁴⁸ <https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf>. Lazard's Levelized Cost of Energy Analysis – Version 9.0.



1

2 From the perspective of PG&E's *Renewal Cost Application* cost analysis, it is conceivable PG&E
 3 was not aware of the exact nature and magnitude of the downward trend in the price of renewable energy.
 4 Considering their vast planning resources and intimate understanding of the energy industry, however,
 5 PG&E must have been aware of the changing landscape for renewable energy costs as early as anyone in
 6 the industry, and under the changing circumstances should have been continually reassessing the viability
 7 and logic of continuing to spend money on the DCNPP relicensing effort. PG&E was remiss in not doing so
 8 and reversing its decision to seek DCNPP license extensions at a much earlier date.

9 Had the State of California considered nuclear power as a "green" or "non-carbon" constituent of its
 10 Renewable Portfolio Standard ("RPS"), there could have been a conceivable rationale for PG&E to seek to
 11 continue DCNPP operations for as long as possible. The 2160 megawatts of "green" baseload capacity
 12 DCNPP might have provided under such a standard would have gone a long way toward meeting
 13 California's RPS requirements. This, however, was never an option. California has a long history of
 14 disfavoring nuclear power as an option, even going as far as placing a moratorium on new nuclear power

1 plants in 1976. For PG&E to assume that a reclassification of nuclear power as “green” energy would
2 occur was unreasonable and imprudent and resulted in an irresponsible investment in license extensions.

3 Given that Diablo Canyon is not considered by California’s rules to be an RPS resource, its large
4 size and operating characteristics pose an obstacle to achieving California’s RPS objectives. In order to
5 meet the state-mandated RPS requirements, the grid must be able to accept as much renewable energy as
6 possible, whenever such energy is available, which means other non-RPS generators on the grid must be
7 able to back down rapidly as the RPS sources come on line and deliver power. When the sun sets or the
8 wind dies, non-RPS plants must be able to ramp up to quickly to fill the void. This grid-stabilizing and
9 power-shaping function is presently met by fast-responding generators such as natural-gas combined-cycle
10 power plants. This issue of renewable integration has been a known concern for some time,⁴⁹ but as the
11 RPS requirement has increased under changes to California law in April of 2011 and October 2015, the
12 operational issues associated with grid management have been exacerbated, resulting in negative market
13 prices and curtailments. DCNPP’s physical design and reactor core physics are ill-suited to operating in
14 this environment or providing a solution to the challenges of renewable intermittency.

15 Another of the replacement energy options considered by PG&E was coal-fueled integrated
16 gasification combined-cycle generation with associated carbon capture and sequestration. This alternative
17 is not a common source of energy anywhere and a relatively new, extremely expensive technology. As of
18 2015, coal-fired power plants served only six percent (6%) of California’s electricity needs, predominantly
19 through out-of-state generation sources, and that percentage is expected to decline to zero by 2026,⁵⁰
20 making this type of generation an unrealistic, unlikely and expensive source of replacement power. In
21 essence, this was never a viable option and should not have been included in the *Renewal Cost*
22 *Application* study.

23 In summary, when PG&E ultimately announced the decision to abandon their relicensing effort in
24 2016, they listed justifications that included: (i) downward sales pressure resulting from energy efficiency
25 policies, distributed generation, and community choice and direct access options; (ii) a decreasing need for
26 baseload generation and issues related to renewable overgeneration; and, (iii) ongoing cost escalation at
27 DCNPP. While A4NR and SLOMFP agree with these justifications, it should be noted PG&E considered
28 nearly all of these justifications in its 2010 *Renewal Cost Application* economic study and determined that

⁴⁹ <http://www.caiso.com/2821/2821c31a21680.pdf>. California Independent System Operator, “Renewable Integration: Market and Product Review Phase 1.”

⁵⁰ http://www.energy.ca.gov/renewables/tracking_progress/documents/current_expected_energy_from_coal.pdf. California Energy Commission, Actual and Expected Energy from Coal for California – Overview 2016.

1 they were clearly outweighed by the option of extending DCNPP's operating life. Had a more robust,
2 comprehensive and complete cost study been performed in 2010, subject to proper review and regulatory
3 approvals, followed by rigorous and continued reassessment of alternative resources, A4NR and SLOMFP
4 strongly believe neither PG&E nor this Commission would have opted to pursue the DCNPP license
5 extensions in the first place, or that PG&E would have made the decision to abandon the license
6 extensions much sooner. Based upon this conclusion and the supporting reasoning presented above,
7 A4NR and SLOMFP strongly recommend the Commission disallow the rate recovery for the costs of
8 license renewal sought by PG&E in this application.

9 **2. The Changing Regulatory Environment**

10 **(a) PG&E's Deficient Seismic Risk Assessment**

11 A narrow focus on core-damage-frequency calculations, the primary metric of federal radiological
12 safety regulation, in DCNPP seismic evaluations appears to have prompted PG&E to ignore the economic
13 risks to ratepayers posed by earthquakes – those risks preeminently include extended plant shutdowns
14 and/or extensive required retrofits. Economic regulation of nuclear power plants – as opposed to
15 radiological safety -- is a function of state government, not the NRC. These financial risks are implicitly
16 absorbed by ratepayers, not shareholders, as an inescapable aspect of a public utility's provision of electric
17 service to its customers. But such risks must be prudently managed, and their full evaluation was a
18 necessary element of an informed decision about DCNPP relicensing by PG&E and this Commission.
19 There is no evidence that PG&E has performed such an analysis, let alone shared it with this Commission.

20 The California Energy Commission's 2008 *AB 1632 Report* identified the experience of Japan's
21 Kashiwazaki-Kariwa Nuclear Power Plant after the 2007 Niigata Chuetsu-Oki earthquake as offering "some
22 lessons for California's nuclear plant operators."⁵¹ Kashiwazaki-Kariwa is the largest nuclear power plant in
23 the world, with the capacity to generate 8,200 megawatts of power when operating. The plant experienced
24 ground motions significantly higher than its design-basis Safe Shutdown Earthquake ("SSE"), yet suffered
25 no significant damage to safety-related structures, systems, or components. Nevertheless, seven units at
26 the plant were shut down for twenty-two to forty months to allow extensive investigations and a re-
27 evaluation of the seismic design standards for the plant. A similar experience occurred in Japan at the
28 Onagawa plant in 2005, where basemat accelerations exceeded that plant's SSE, caused no damage to
29 safety-related structures, systems or components, but triggered five- to seven-month shutdowns for three

⁵¹ California Energy Commission, *AB 1632 Report*, pp.12 to 13.

1 units. Similarly, in 2007, Japan's Shika plant was idle for a year after ground motions exceeded the SSE's
2 in-structure response spectra, despite the absence of damage to safety-related structures, systems, or
3 components.⁵² At the Energy Commission's 2008 hearing on the AB 1632 Report, PG&E professed great
4 familiarity with the Japanese approach to seismicity at nuclear plants. As described by PG&E's head of
5 geosciences, Lloyd Cluff, and engineering seismologist Dr. Norman Abrahamson, PG&E has had working
6 relationships with all of the power companies in Japan for years, had regularly sent teams to work with
7 Japanese utilities in the aftermath of earthquakes, and had made several trips at the invitation of Tokyo
8 Electric to advise on the post-earthquake Kashiwazaki-Karawi circumstances.⁵³ Dr. Abrahamson also
9 expressed the opinion that the nuclear industry had not adequately addressed the seismic vulnerability of
10 non-safety systems because of the NRC's emphasis on safety.⁵⁴

11 Each of the above-described shutdown experiences took place in pre-Fukushima Japan, and
12 public pressure on regulators to extend such outages has obviously grown post-Fukushima. A4NR
13 believes a similar public reaction, with the potential for extended shutdowns, would likely occur in California
14 if significant ground motions were experienced at DCNPP, even if no damage was caused to safety-related
15 structures, systems, or components. In 2009, PG&E's analysis of a hypothesized seventeen-month outage
16 necessary to replace DCNPP's once-through-cooling system estimated replacement power costs of
17 \$1,805,700,000,⁵⁵ or about \$107 million per outage month. The cost of any required seismic retrofits would
18 have to be added to these amounts to provide an accurate benchmark, but even the replacement power
19 costs alone would produce startling results if the Japanese outages were revisited at DCNPP: \$535 million
20 to \$749 million to reprise the Onagawa experience; \$1.284 billion if the Shika example was the model; and
21 \$2.354 billion to \$4.280 billion if the Kashiwazaki-Karawi outages were repeated. Such costs would be
22 material contributors to a properly structured risk-informed cost/benefit analysis of relicensing DCNPP, but
23 there is no indication they have ever been considered by PG&E even though they were known when the
24 company's relicensing expenditures commenced.

⁵² Descriptions of the Japanese SSE-related outages are taken from EPRI Report 3002005284, "Guidelines for Nuclear Power Plant Response to an Earthquake," October 2015, p. 1-3. After the 2011 Tohoku earthquake, each of the plants has remained idle.

⁵³ *Reporter's Transcript*, September 25, 2008, Energy Commission Workshop on AB 1632 Report, pp.85 to 95.

⁵⁴ *Id.*, pp.84 to 86.

⁵⁵

http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/powerplants/diablo_canyon/docs/rc_dc_pres032811.pdf.

1 According to the NRC's December 17, 2008, "Action Plan for the Study of the Shoreline Fault,"
2 which ordered evaluation of ground motions from a possible synchronous Hosgri/Shoreline rupture, PG&E
3 had preliminarily estimated earthquake magnitudes from the Shoreline Fault alone of 6.25 and 6.5 based
4 on rupture lengths of 15 kilometers and 24 kilometers, respectively.⁵⁶ This early assessment by PG&E,
5 destined to be revised significantly upward in subsequent analyses, echoed the very risk Dr. Abrahamson
6 had acknowledged three months earlier at the Energy Commission hearing on the AB 1632 Report:

7 "[A]t Diablo Canyon we would be concerned with a magnitude say 6.25 earthquake on the
8 Hosgri Fault that might give us .2 or .3 Gs of peak accelerations, less than half of what our design
9 basis is. But it is the non-safety-related systems that are potentially being damaged, would be
10 damaged by those and then would put us out of operation, even though all our safety systems
11 performed properly."⁵⁷

12 The Energy Commission's *AB 1632 Report* observed, "the CPUC's GRC 2007 decision clearly
13 directs PG&E not only to defer to the extent feasible its own license renewal study until after the Energy
14 Commission issues its AB 1632 findings and conclusions, it requires PG&E to incorporate the Energy
15 Commission's *AB 1632 Report's* assessment, findings and recommendations into their license renewal
16 feasibility study."⁵⁸ Concurrent with the Energy Commission's adoption of its *AB 1632 Report* in 2008,
17 PG&E announced that the United States Geological Survey had validated the presence of a previously
18 unrecognized major offshore hazard — the Shoreline Fault — less than a mile from DCNPP. The Energy
19 Commission's *2009 Integrated Energy Policy Report*, citing Commission Decision 07-03-044 and the June
20 25, 2009, letter from Public Utilities Commission President Michael Peevey to PG&E Chief Executive
21 Officer Peter Darbee, recommended that PG&E complete all of the AB 1632 seismic studies, including
22 lessons learned from the Kashiwazaki-Karawi experience, as part of the state's DCNPP license renewal
23 review, and that the utility should not file a license renewal application with the NRC without prior approval
24 from the CPUC.⁵⁹

25 Regarding a core recommendation in the *AB 1632 Report* that PG&E perform a deterministic
26 analysis of a San Simeon-type earthquake (*i.e.*, blind thrust, magnitude 6.5) directly beneath Diablo
27 Canyon and the resultant vulnerability of both safety-related and non-safety related systems and
28 components, PG&E simply demurred. The company's July 27, 2009, response to the Energy Commission
29 was, "For reliability studies, the probability of the scenario is a key part of the evaluation. PG&E plans to

⁵⁶ <https://www.nrc.gov/docs/ML0835/ML083540266.pdf>.

⁵⁷ *Reporter's Transcript*, CEC Workshop on AB 1632 Report, p. 83, September 25, 2008.

⁵⁸ California Energy Commission, *AB 1632 Report*, p.33.

⁵⁹ California Energy Commission, *2009 Integrated Energy Policy Report*, pp.238 to 239.

1 address the San Simeon-type earthquake and all other earthquakes using a probabilistic approach rather
2 than the deterministic scenario approach recommended by the *AB 1632 Report*.⁶⁰

3 The company avoided responding directly to Energy Commission inquiries in 2009 about the
4 vulnerability of non-safety related structures, systems and components in light of changes in seismic design
5 codes and standards since DCNPP's construction, as well as estimated outage times and strategies to
6 minimize such outages. In each instance, PG&E deferred to a future study it planned to complete in 2010.
7 This study, performed by Enercon and submitted in PG&E's aborted *Renewal Cost Application*, was
8 derived from an EPRI database of ground motions of 0.15g and 0.5g at thirty-nine power plants (thirty-eight
9 of them fossil) between 1971 and 1997.⁶¹ The study excluded the near-source risk of the Shoreline Fault
10 from its determination of "Seismic Source Types Impacting DCPD Site" and dismissed the significance of
11 building code evolution over forty years as relevant only to equipment anchorage, while admitting that
12 anchorage issues accounted for perhaps twenty percent (20%) of equipment damage in the EPRI data
13 base. The study also indicated that non-safety structures, systems and components are in general too
14 complicated to be mathematically modeled in an accurate manner for the effect of earthquake forces. The
15 study further conceded that the 1997 Uniform Building Code and 2001 California Building Code lateral force
16 prescriptions for anchorage were more stringent for high seismic zones than the 1976 requirements applied
17 to DCNPP's original design and that both the 1997 Uniform Building Code and 2007 California Building
18 Code are significantly more stringent when elevation within building and flexible equipment are included.
19 Notwithstanding these many shortcomings, the Enercon study concluded that ground motion greater than
20 0.2g may exceed the allowable load of the main turbine thrust bearings, threatening rotating-to-stationary
21 blade contact and extensive turbine damage which would take one to two years to repair.⁶²

22 Although not included in the EPRI data base, the Enercon study was dismissive of the applicability
23 of the Kashiwazaki-Kariwa experience: "The extended shutdown was due to regulatory issues and public

⁶⁰ California Energy Commission Docket 09-IEP-IL, "PG&E's Responses to CEC's Nuclear Power Plant Data Requests," July 27, 2009, p. 20.

⁶¹ See *Renewal Cost Application*, "Supplemental Reports Recommended by the California Energy Commission," Attachment 2.2, PG&E Responses to Kashiwazaki-Kariwa Nuclear Power Station Lessons Learned. Only one experience at a nuclear plant is included in the database: Humboldt Bay Unit 3, and the 0.30g 1975 Ferndale earthquake. The study identifies the recovery time as "hours," but fails to mention that PG&E closed the plant at its next refueling, determined necessary seismic upgrades were uneconomic, and never reopened it.

⁶² See *Renewal Cost Application*, "Supplemental Reports Recommended by the California Energy Commission," Attachment 2.3, Enercon Seismic Assessment of Diablo Canyon Power Plant Non-Safety Related Structures, Systems, and Components.

1 concerns of earthquake design adequacy, not for plant damage.”⁶³ PG&E’s own appraisal of “lessons
2 learned” from Kashiwazaki-Kariwa sidestepped completely the extended outage concern that dominated
3 the *AB 1632 Report*. Seizing upon an October 24, 2007, report published by the Institute for Nuclear
4 Power Operations just three months after the Niigata Chuetsu-Oki earthquake, which coincidentally had
5 “lessons learned” in its title but predated the *AB 1632 Report* by thirteen months, PG&E confined its
6 assessment to operational items rather than address the significant financial risks attendant to prolonged
7 shutdowns. Had the *Renewal Cost Application* proceeded to evidentiary hearings, A4NR and SLOMFP are
8 confident that neither the Enercon study nor PG&E’s purported “lessons learned” submittal would have
9 been found adequately responsive to the *AB 1632 Report* or President Peevey’s June 25, 2009, letter to
10 Peter Darbee demanding that PG&E produce specific information regarding DCNPP’s vulnerability to
11 seismic events.

12 The NRC’s senior resident inspector at DCNPP informed PG&E in September 2010 that his
13 reading of PG&E’s earlier analysis indicated that the Shoreline Fault could produce ground motions *seventy*
14 *percent in excess of DCNPP’s licensed Safe Shutdown Earthquake*. PG&E’s January 2011 report to the
15 NRC on the Shoreline Fault reached similar conclusions regarding the San Luis Bay Fault and the Los
16 Osos Fault. Later in 2011, PG&E addressed these issues not by addressing the implicated risks, but by
17 seeking to amend the DCNPP licenses to relax the Safe Shutdown Earthquake design basis in order to
18 avoid any potential compliance problems. As PG&E disclosed in its Form 10-Q filing with the Securities and
19 Exchange Commission:

20 “[I]n early August 2011, the NRC found that a report submitted by the Utility to the NRC on
21 January 7, 2011 to provide updated seismological information did not conform to the requirement
22 of the current Diablo Canyon operating license. On October 21, 2011, the Utility filed a request
23 that the NRC amend the operating license to address this issue. If the NRC does not approve the
24 request the Utility could be required to perform additional analyses of Diablo Canyon’s seismic
25 design which could indicate that modifications to Diablo Canyon would be required to address
26 seismic design issues. The NRC could order the Utility to cease operations until the modifications
27 were made or the Utility could voluntarily cease operations if it determined that the modifications
28 were not economical or feasible.”⁶⁴

⁶³ *Id.*; see p. 15 of Enercon report. Appendix 3, p.21: “Damage to turbine bearings was reported by engineers at Tokyo Electric for operating units at the Kashiwazaki-Kariwa Nuclear Power Plant (KKNPP) in the magnitude 6.8 earthquake in Japan in 2007. The KKNPP steam units are essentially the same size as Diablo Canyon’s, and would therefore be considered the most representative data point. Ground motion at the KKNPP site was measured at about 0.60g, indicating an apparent shaking intensity of MMI VIII+. While this intensity of shaking is very unlikely for the DCCP site, the instance of turbine bearing damage at KKNPP raises a particular concern. It would appear that the small size of the EPRI data sample for large turbine generators, and the occurrence of multiple instances of damage to bearings, would warrant special consideration.”

⁶⁴ PG&E Corporation, Form 10-Q filing, November 3, 2011, p.63.

1 In 2012, the NRC granted PG&E the requested reprieve, allowing PG&E to withdraw its proposed
 2 license amendment and defer evaluation of the Safe Shutdown Earthquake requirement until completion of
 3 its probabilistic assessment of the DCNPP seismic hazard in 2015. The NRC's December 21, 2016,
 4 approval of PG&E's submittal confirms beyond dispute what A4NR and many others have asserted (and
 5 PG&E has known since at least 2010) for years: that potential earthquake-related ground motions at
 6 DCNPP significantly exceed the plant's Safe Shutdown Earthquake design basis. The degree of
 7 exceedance across all sensitive frequencies is vividly illustrated on the next-to-last page of the NRC report:

8

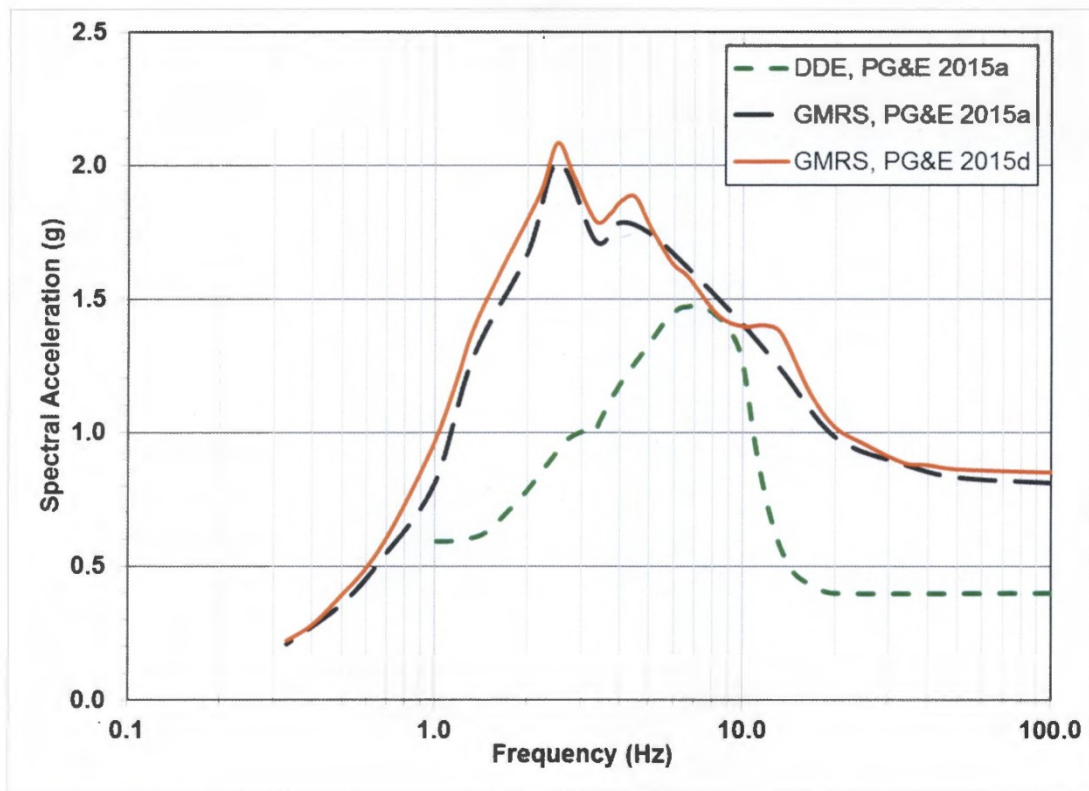


Figure 3.5-1. Initial Ground Motion Response Spectrum (GMRS; black dashed line) and Double Design Earthquake (i.e., SSE; green dashed line) from SHSR for DCP (PG&E, 2015a). Revised GMRS (red solid line) from PG&E (2015d).

9

10 A4NR and SLOMFP do not ask this Commission to second-guess the NRC's assessment of the
 11 radiological safety implications of these exceedances – A4NR and SLOMFP anticipate that these
 12 implications and related responses will be addressed in the seismic hazard risk evaluation PG&E will
 13 complete in late 2017. Instead, the pertinent question for this Commission is whether it was reasonable for

1 PG&E to incur costs in pursuit of DCNPP relicensing without fully evaluating ratepayer financial exposure to
2 an unmistakable seismic shutdown and/or retrofit risk. The answer to that question is as clear as the
3 NRC's Figure 3.5-1 above.

4 It was not until after the cataclysmic Tohoku seismic event that PG&E finally abandoned its
5 consistent and continual dismissal of the importance of completing the seismic studies required by state
6 law as a precursor to spending ratepayer money on license renewal⁶⁵ – years late, PG&E accepted the
7 dismissal of the *Renewal Cost Application* pending the completion of those studies. Yet, without any
8 authority from the Commission to invest in license renewal, PG&E continued to spend tens of millions of
9 dollars on the DCNPP license extensions while simultaneously refusing to discuss the prudence or
10 economics of the DCNPP license-renewal option. In doing so, PG&E ignored requests from two
11 Commission Presidents for updates and indicated as recently as the *PG&E Test Year 2017 General Rate*
12 *Case* that the subject of license renewal was simply not open for public discussion. Facing potentially large
13 rate reductions under the assumption that DCNPP would remain in service through 2044-2045 and new
14 calls for a demonstration of DCNPP's cost-effectiveness as a resource beyond 2024-2025 in that case,
15 PG&E finally capitulated and agreed to the terms of the Joint Proposal. PG&E's prolonged indecision
16 regarding DCNPP's operating life neither evidences nor supports reasonably drawn inferences that the
17 license-renewal option had unassailable value or that PG&E was even reassessing the original economic
18 analyses filed in the *Renewal Cost Application*.

19 (b) Changes in the Regulatory Environment

20 At the time PG&E unilaterally decided to initiate its request to extend the DCNPP operating
21 licenses, there were several important changes to the regulatory environment that, individually and
22 collectively, should have caused PG&E to proceed with considerable caution. At minimum, prudence
23 dictated that PG&E should have sought and received authority from this Commission prior to filing for
24 license extensions before the NRC. PG&E acknowledges each of these influences in its case-in-chief, but
25 does not provide any explanation for why it ignored for years the potential for these influences to undermine
26 the long-term cost-effectiveness of pursuing the DCNPP license extensions. Had PG&E evaluated these

⁶⁵ As early as June 2009, Commission President Michael Peevey had explicitly warned PG&E of the link between the completion of the seismic studies and state regulatory review of the prudence of license renewal. See correspondence from *Michael R. Peevey to Peter A. Darbee, President and Chief Executive Officer, Pacific Gas & Electric Company*, dated June 25, 2009, *PG&E Response to A4NR Data Request 1.25, Attachment 2*, Application 16-08-006, September 12, 2016.

1 influences properly, A4NR and SLOMFP believe PG&E could have and would have avoided all of the costs
2 of relicensing it now seeks to recover through rates.

3 In 2002, the California Legislature authorized certain political subdivisions to act as “community
4 choice aggregators.” This would allow public agencies to procure and deliver energy to their citizens in lieu
5 of taking bundled electric services from electric utilities.⁶⁶ The institution of community choice aggregation
6 and the significant reductions to bundled loads seen in the PG&E service territory are arguably the most
7 important factors that led PG&E to conclude that DCNPP would become an uneconomic, and potentially
8 stranded, asset during the 2024-2045 license-extension period.⁶⁷

9 At the same time as community choice aggregation was growing, the California Independent
10 System Operator (“California ISO”) began to study the effects on resource adequacy and transmission
11 stability caused by California’s renewable portfolio standards. The variability and intermittency of energy
12 deliveries from the growing base of wind and solar resources had prompted the California ISO to consider,
13 and later adopt, standards setting the minimum levels of resources possessing “flexibility” attributes need to
14 operate the California ISO grid reliably.⁶⁸ Consistent with its design and universal practice for pressurized
15 water reactors in the domestic nuclear power industry, DCNPP has always been operated as a baseload
16 plant. This mode of operation was incompatible with the flexibility characteristics sought by the California
17 ISO. The California ISO’s need for flexible resources would only grow as California’s renewable-energy
18 standards increased and, concomitantly, DCNPP would only become more and more of a misfit in light of
19 PG&E’s declining bundled loads, increasing renewable energy deliveries and the adoption of flexible-
20 capacity requirements.⁶⁹

⁶⁶ See 2002 Assembly Bill 117 (Migden), *Stats.2002*, ch.838.

⁶⁷ See *Pacific Gas & Electric Company: Retirement of Diablo Canyon Power Plant, Implementation of the Joint Proposal, and Recovery of Associated Costs through Proposed Ratemaking Mechanisms – Prepared Testimony*, Chapter 2 (Frazier-Hampton), at p.2-10, Table 2-2, showing a 2030 loss of bundled sales to community choice aggregation and direct access of 37,000 gigawatt-hours; also, *PG&E Response to A4NR Data Request 1.2*, Application 16-08-001, September 12, 2016.

⁶⁸ The California ISO began an intensive study of the need for flexible-ramping requirements in 2007. See *Integration of Renewable Resources: Transmission and Operating Issues and Recommendations for Integrating Renewable Resources on the California ISO Grid*, November 2007 (available on the California ISO public website at www.caiso.com/1ca5/1ca5a7a026270.pdf). See also, California ISO *Fifth Replacement Tariff*, Section 40.10 (Flexible RA Capacity).

⁶⁹ *PG&E Responses to A4NR Data Request 1.3 and 1.4*, Application 16-08-006, September 12, 2016, re decreasing need for baseload generation and re increasing solar resource, respectively, each of which concludes, “continued operation of [DCNPP] will likely exacerbate the prospect of over-generation conditions in the future as more solar resources continue to come on line,” citing *PG&E’S Workpapers Supporting Prepared Testimony, Chapter 2, pages 2-6 through 2-23*.

1 Rather than proceed cautiously under these changing regulatory conditions, PG&E attempted to
2 bend the emerging regulatory environment to DCNPP's advantage. PG&E unsuccessfully attempted to
3 abate the loss of bundled loads to community choice aggregators by sponsoring a ballot proposition aimed
4 at making it more difficult for public agencies to recruit customers.⁷⁰ PG&E also negotiated with the
5 California ISO to have some part of DCNPP capacity classified as "flexible," despite the fact that the
6 operation of a nuclear power plant of DCNPP's design as a load-following resource had never before been
7 attempted, was inconsistent with vendor recommendations since operating DCNPP in a load-following
8 mode subject to ramping instructions would take the plant outside previously analyzed operating conditions,
9 and raised certain safety and reliability concerns identified by internal PG&E engineering analyses.⁷¹
10 Although the California ISO agreed to permit PG&E to count a small portion of DCNPP capacity towards
11 meeting the utility's flexible-capacity requirements, the numerous restrictions placed on the California ISO's
12 ability to ramp DCNPP dispatch up or down severely limits the extent to which DCNPP would be allowed to
13 meet those requirements. Finally, PG&E unsuccessfully attempted to have DCNPP classified as a "quasi-
14 renewable" resource in an effort to force-fit nuclear power into California's increasingly renewable-energy
15 environment.⁷²

16 PG&E's fight against the foregoing regulatory trends demonstrates the company's awareness that
17 these trends, individually and collectively, would dramatically and adversely affect the prudence and cost-
18 effectiveness of preserving DCNPP's place in a least-cost, best-fit resource portfolio. But rather than test
19 this Commission's view of how DCNPP would fit the emerging regulatory environment and/or how the
20 regulatory environment might be reshaped so as to preserve DCNPP's cost-effectiveness, PG&E simply
21 proceeded to seek license extensions from the NRC and attempt to turn the tide of regulatory evolution to
22 suit PG&E's decision to protect DCNPP from retirement. Given the number and difficulty of the rear-guard
23 actions required to protect DCNPP's commercial viability, PG&E knew or should have known that the
24 failure of any of its regulatory initiatives would result in the significant diminution of DCNPP's value to

⁷⁰ See 2010 Proposition 16. Following the failure of the measure at the ballot box, the California Legislature passed 2011 Senate Bill 790 (Leno), *Stats.2011*, ch.599, declaring that the formation and operation of community choice aggregators was in the public interest and directing the Commission to adopt rules of conduct curbing the exercise of a utility's market power and use of ratepayer funds to defeat the formation of a community choice aggregator.

⁷¹ See *Prepared Direct Testimony of John L. Geesman on Behalf of the Alliance for Nuclear Responsibility*, Exhibit A4NR-2 in Application 15-09-001, Attachment 2, *PG&E Response to Data Request A4NR 7.1* ("Memorandum of Site Vice President – Diablo Canyon Power Plant to Senior Vice President – Energy Procurement, et al., Re Diablo Canyon Power Plant Scheduling Guidelines", dated September 29, 2014 (redacted)).

⁷² See *PG&E Response to A4NR Data Request 1.34.1*, Application 16-08-006, September 12, 2016.

1 PG&E's electric customers. Under these circumstances, PG&E, and not electric customers, should bear
2 the risk of failure and the resulting and foreseeably wasted costs of license renewal.

3 **3. The Failure to Update the *Renewal Cost Application* Economic Analysis**

4 PG&E's application and supporting testimony do not describe the controls PG&E put into place or
5 the steps PG&E took to oversee its license-renewal costs as those costs mounted month-by-month.
6 Similarly, PG&E's application and supporting testimony do not describe any attempt by senior management
7 to revisit its approval of the NRC filing during the period November 2009 through June 2016. A4NR
8 attempted to have PG&E divulge the extent to which PG&E reviewed the economic analyses upon which
9 the *Renewal Cost Application* was submitted, but PG&E refused to provide any information demonstrating
10 that the company updated its conclusions as to the cost-effectiveness of extending DCNPP's operating life
11 prior to mid-2016, claiming that all such studies, to the extent they might exist, were attorney work products
12 or otherwise privileged and confidential. While PG&E may certainly protect its attorney work products from
13 public view, PG&E is still required to demonstrate the reasonableness of the costs it seeks to recover
14 through electric rates and its refusal to provide any indication that it was prudently managing the license-
15 renewal project by critically evaluating the project's efficacy fails such a demonstration. A4NR and
16 SLOMFP submit that had PG&E seriously and continuously reevaluated the material factors affecting the
17 economics and prudence of license renewal, PG&E would have determined that the confluence of these
18 factors, including the regulatory conditions and changes in the economic assumptions upon which its
19 decision to proceed was based, the termination of the NRC proceedings would have occurred well before
20 June 2016 and the recorded costs PG&E incurred in pursuit of the DCNPP license extensions would have
21 been reduced well below the levels included in the instant application.

22 **4. The Absence of a Demonstration of the Reasonableness of the Costs of License** 23 **Renewal**

24 Adding to the failure of PG&E to make any showing demonstrating the reasonableness of its
25 license-renewal costs are facts and inferences demonstrating that these costs are imprudent and/or
26 unreasonable. A review of PG&E's records indicate a substantial portion of PG&E's license-renewal costs
27 are intrinsically unreasonable themselves.

28 Following the Tohoku seismic and tsunami event, PG&E advised the NRC in April of 2011 that
29 PG&E intended to complete seismic studies required by state law and this Commission before seeking the
30 issuance of a coastal consistency certification by the California Coastal Commission or final processing by

1 the NRC of the license-renewal application.⁷³ PG&E requested that the NRC place the DCNPP license-
 2 renewal application “on hold” pending the completion of the seismic studies. Notwithstanding the indefinite
 3 hold placed on the license-renewal application over the next several years, PG&E’s records indicate its
 4 internal costs remained constant: recorded project management expenses do not bear any apparent
 5 relationship to project activities and other costs, particularly to capitalized administrative and general costs
 6 charged by the company to all capital projects:

7 **A4NR Table 4**
 8 **DCNPP License Renewal Costs**
 9 **2011 to 2016**

10 (Thousands of Nominal \$)

Year	Project Team	Safety and Technical Review	Environmental Review	Adjudicatory Process	NRC Staff Review Fees	Capitalized A&G
2009	1,505	0	0	0	0	101
2010	3,217	2,265	170	500	3,116	244
2011	3,107	440	2	301	1,378	351
2012	1,741	320	9	187	47	62
2013	1,141	151	64	170	17	71
2014	1,850	57	34	436	24	75
2015	1,609	1,241	75	542	831	110
2016	361	177	20	48	1,658	99
Total	14,531	4,651	374	2,183	7,072	1,113

12 It is incumbent on PG&E to explain the lack of consistency in the costs charged to the project, particularly
 13 its internal costs. With the project in suspense in early 2011, project management costs should have been
 14 minimal during that year, and more closely traced the declines in other costs shown in the table. This
 15 brings the reasonableness of the costs of the project into doubt, and with PG&E only submitting evidence
 16 that it recorded these costs on an accounting basis, the Commission should not presume the costs to be
 17 reasonable but rather reject rate recovery for license-renewal costs.⁷⁴

18 The issues raised by PG&E’s omission of any such explanation are compounded by a comparison
 19 of the project team costs to the original costs PG&E forecasted for this aspect of the license-renewal
 20 project. In the *Renewal Cost Application*, PG&E forecasted its total internal team management costs for

⁷³ See *PG&E Response to A4NR Data Request 1.25, Attachment 11*, Application 16-08-006, September 12, 2016.

⁷⁴ So this begs the question of what were these project managers doing while the project was on hold. Well, on at least one occasion, it appears someone went out to play a round of golf and charged it to the project. See *PG&E Response to A4NR Data Request 1.25, Attachment 1, Master Costs*, Line 1145, Application 16-08-001, September 12, 2016.

1 the entire project to be \$16.5 million, *assuming the pursuit of the license-renewal application to a*
2 *successful completion*. Thus, not only did PG&E incur internal costs nearly equal to the management costs
3 it forecasted in the *Renewal Cost Application*, but did so while the license-renewal project was in
4 suspension, headed toward its inevitable failure.

5 **5. The Recovery of AFUDC**

6 In some cases involving failed or abandoned projects, the Commission has permitted the utility to
7 recover its reasonable costs for those projects. But even in cases where the utility demonstrates the
8 project to have been prudently undertaken and the costs of the project to have been reasonable, the
9 Commission has required the utility to “share the risk” associated with the failed or abandoned project. This
10 risk-sharing has taken the form of the disallowance of all, or in a few cases, some of the AFUDC charged to
11 the project prior to its abandonment. Here, even if some of DCNPP’s license-renewal costs were deemed
12 to be reasonable, the Commission should follow its precedents and disallow the \$15.4 million of AFUDC so
13 as to share the risk of project failure between ratepayers and PG&E’s shareholders.⁷⁵

14 **VI. Proposed Ratemaking and Cost Allocation Issues**

15 As part of the settlement reached between PG&E and A4NR in the *PG&E Test Year 2017 General*
16 *Rate Case*, PG&E agreed to “provide an annual update to its Test Year 2017 General Rate Case forecast
17 of the planned capital improvements, projects and additions for Diablo Canyon as part of its implementation
18 of the Joint Proposal, should the Joint Proposal be approved by the Commission.”⁷⁶ As part of the Joint
19 Proposal, PG&E proposes to implement this aspect of the *PG&E Test Year 2017 General Rate Case*
20 settlement by filing an annual Tier 3 advice letter to reconcile the forecast values for capital additions
21 adopted by the Commission in the *PG&E Test Year 2017 General Rate Case* with the actual recorded
22 values for the relevant years, and to “true-up” DCNPP capital-related revenue requirement as part of this
23 reconciliation.⁷⁷

⁷⁵ A4NR and SLOMFP are aware of at least one case where the Commission reduced the recovery of AFUDC accruals so as to limit the utility’s recovery to carrying costs determined using the utility’s cost of debt. If the Commission were to allow the recovery of AFUDC charged at PG&E’s cost of debt rather than PG&E’s full rate of return reflecting a return on equity, the amount of AFUDC recoverable through rates would be reduced to \$10.3 million. (See *PG&E Response to A4NR Data Request 1.39.1*, Application 16-08-006, September 12, 2016.) A4NR and SLOMFP are not recommending this alternative, but provides this figure to complete the evidentiary record.

⁷⁶ See *Settlement Agreement*, at Section 3.2.3.1.4(B), Application 15-09-001, August 3, 2016.

⁷⁷ See *Pacific Gas & Electric Company: Retirement of Diablo Canyon Power Plant, Implementation of the Joint Proposal, and Recovery of Associated Costs through Proposed Ratemaking Mechanisms – Prepared Testimony*, Chapter 10 (Marre/Hoglund), at pp.10-8 to 10-9.

1 Because the Commission's procedures for Tier 3 advice letters provide interested parties with a
2 relatively short period of time within which to file responses and protests, A4NR entered into discussions
3 with PG&E regarding the level of information PG&E would provide as part of the annual Tier 3 advice
4 letters. Following these discussions, PG&E and A4NR reached agreement that, for any DCNPP capital
5 project completed during the reporting year that was not forecasted in the most recent PG&E general rate
6 case where the cost of the project exceeded \$20 million, PG&E will provide the detailed project information
7 submitted to PG&E's Executive Project Committee as an attachment to the annual Tier 3 advice letter.
8 Further, for any DCNPP capital project forecasted in the most recent PG&E general rate case to cost more
9 than \$20 million and, pursuant to PG&E's internal controls, the project required a subsequent review by
10 PG&E's Executive Project Committee because the recorded costs of the project exceeded the costs
11 previously approved by the committee, PG&E will provide the detailed project information submitted to the
12 committee explaining the reasons for the exceedances as an attachment to the annual Tier 3 advice letter.
13 In either case, if the information provided to PG&E's Executive Project Committee includes information
14 deemed by PG&E to be confidential, the information attached to the Tier 3 advice letter may be redacted at
15 PG&E's discretion and provided to those parties executing nondisclosure agreements conforming to
16 Commission practice and procedure. Finally, although PG&E has proposed to submit a report in its Annual
17 Electric True-Up filing addressing cancelled DCNPP capital projects, PG&E has agreed with A4NR that this
18 report should be part of the annual Tier 3 advice letter. The cancellation of a capital project bears a logical
19 nexus to the reconciliation of actual DCNPP net plant-in-service to the forecast net plant-in-service values
20 adopted in a general rate case and, in turn, the reflection of that reconciliation to the reasonable capital-
21 related DCNPP revenue requirement proposed in the annual Tier 3 advice letter.

22 A4NR submits these further details regarding the substance of the annual Tier 3 advice letter
23 process are consistent with the provisions of the *Settlement Agreement* now pending in the *PG&E Test*
24 *Year 2017 General Rate Case*. The additional information PG&E has agreed to provide as attachments to
25 the annual Tier 3 advice letter will allow interested parties to review the same materials made available to
26 PG&E's Executive Project Committee – this committee represents an important internal control for the
27 allocation and management of capital to the various business units within the company, including Nuclear
28 Generation, and is privy to the best available information for projects subject to the committee's approval.
29 Having this information available as part of the annual Tier 3 advice letter will allow interested parties to
30 make an informed and timely decision as to whether to file or omit the filing of a response or protest to the

1 advice letter. With these further details, the annual Tier 3 advice letter process will be more transparent
2 and improve the efficiency of the administrative processes applied to the filings.

3 A stipulation entered into by PG&E and A4NR memorializing the foregoing procedures is attached
4 in the appendix to this testimony. A4NR respectfully urges the Commission to find the stipulation to be
5 reasonable as to all of its provisions and implement the proposed annual Tier 3 advice letter process
6 pursuant to those provisions.

7 **VII. Land Use, Facilities and Decommissioning Issues**

8 A4NR has no position on land-use, facilities or decommissioning issues at this time.

9 **VIII. Additional Issues Not Addressed Above**

10 A4NR does not have any additional issues to raise in this proceeding at this time.

11

1 **EXHIBIT A4NR-1: ATTACHMENT 1**

2 **QUALIFICATIONS OF ROCHELLE BECKER**

3
4 Rochelle Becker is an internationally recognized nuclear energy watchdog who has been engaged
5 with California electric utility issues for forty-one years. Since the late 1970s, she has appeared before the
6 California Public Utilities Commission, the Nuclear Regulatory Commission, the California Energy
7 Commission, the California Coastal Commission, the California State Legislature, the California State
8 Lands Commission, and the United States Congress on matters affecting California's nuclear power plants.
9 In 2005, she co-founded and became Executive Director of the Alliance for Nuclear Responsibility, having
10 served for the previous twenty-five years as a spokesperson for the San Luis Obispo Mothers for Peace.
11 She also previously served as a member of the California State Water Resources Control Board's Review
12 Committee for Nuclear Fueled Power Plants. Ms. Becker is also a former President of the Board of
13 Directors of The Utility Reform Network (nee "Toward Utility Rate Normalization").

14 Recently, Ms. Becker and the Alliance for Nuclear Responsibility sponsored the successful 2015
15 Assembly Bill 361, a bipartisan effort to continue offsite emergency services funding for agencies
16 responsible for first response and disaster recovery at and near the Diablo Canyon Nuclear Power Plant, as
17 well as for the Diablo Canyon Independent Peer Review Panel appointed by the California Public Utilities
18 Commission to oversee PG&E's seismic studies for the plant.

19 Ms. Becker has previously testified before the Commission as an expert witness in many previous
20 proceedings.

21 Ms. Becker is a graduate of the University of San Francisco.

1 **EXHIBIT A4NR-1: ATTACHMENT 2**
2 **QUALIFICATIONS OF JOHN L. GEESMAN**
3

4 John L. Geesman is an attorney with the Oakland law firm, Dickson Geesman LLP, and a member
5 in good standing of the California State Bar.

6 Mr. Geesman served as a member of the California Energy Commission from 2002 to 2008, and
7 was the agency's Executive Director from 1979 to 1983. Between his two tours at the Energy Commission,
8 Mr. Geesman spent nineteen years as an investment banker focused on the U.S. bond markets and served
9 as a financial advisor to municipal electric utilities throughout the West.

10 Mr. Geesman has a long history of providing leadership on issues related to resource planning,
11 environmental policy, financial management, and risk practices. This is demonstrated by his service in
12 numerous executive capacities, including stints as:

- 13 • Co-Chair of the American Council on Renewable Energy;
- 14 • Chairman of the California Power Exchange;
- 15 • President of the Board of Directors of The Utility Reform Network (nee Toward Utility Rate
16 Normalization);
- 17 • Member of the Governing Board of the California Independent System Operator; and,
- 18 • Chairman of the California Managed Risk Medical Insurance Board.

19 Mr. Geesman has previously testified as an expert witness before the California Public Utilities
20 Commission.

21 Mr. Geesman is a graduate of Yale College and the University of California Berkeley School of
22 Law.

1 **EXHIBIT A4NR-1: ATTACHMENT 3**
2 **QUALIFICATIONS OF RICHARD WOLFE**
3

4 Richard ("Rick") Wolfe is Vice President, Chief Financial Officer and founder of Resero Consulting,
5 Inc., an economic, energy policy and engineering consulting firm located in Granite Bay, California. Mr.
6 Wolfe is an experienced technology leader and engineer with a broad technical background in the areas of
7 electrical transmission systems, power plant operations, procedure development and implementation,
8 facility management, network engineering, project management, disaster recovery, finance and accounting,
9 enterprise security, audit, and risk assessment. Resero Consulting provides expert support to companies
10 and organizations whose critical business issues are affected by wholesale energy markets. The firm
11 specializes in quantitative and qualitative policy analysis and facilitating critical multistakeholder processes.
12 The firm's clients include, among others, the Federal Energy Regulatory Commission, the Public Utility
13 Commission of Texas, Sempra Energy, Shell Energy North America (US) L.P., Calpine, Powerex, the City
14 and County of San Francisco, the City of Anaheim, Cambridge Energy Services, Charles River Associates,
15 the Energy Producers and Users Coalition, and the Western Power Trading Forum.

16 Prior to forming Resero Consulting, Mr. Wolfe was employed by McKesson Corporation from 1995
17 to 2003 as Director of Engineering Services, where he was responsible for McKesson's \$10 million annual
18 engineering and facilities budget. As Director, he oversaw operations and projects in a variety of
19 disciplines, including Network Engineering, Audit Liaison, Disaster Recovery, Technical Help Desk,
20 Accounting, and Physical Security.

21 Mr. Wolfe also held a variety of positions with the Sacramento Municipal Utility District at the
22 Rancho Seco Nuclear Generating Station from 1981 to 1992, including Assistant Shift Supervisor, Nuclear
23 Licensing Instructor, and Technical Procedure Writer. Mr. Wolfe held a Senior Reactor Operator's license
24 issued by the Nuclear Regulatory Commission and had managerial responsibilities for operations,
25 maintenance, construction, and project testing at the nuclear power plant. During this time, Mr. Wolfe was
26 responsible for the development and maintenance of the Rancho Seco operator manuals and procedures,
27 which transmuted applicable federal, state and local regulations, permits and requirements, including NRC
28 radiological safety regulations, into the step-by-step procedures and guidelines necessary to maintain the

1 plant's compliance with those regulations, permits and requirements. Mr. Wolfe also worked as part of an
2 integrated team assigned to assess risk, vulnerability, and regulatory compliance of the plant's operating
3 and safety systems.

4 Mr. Wolfe holds a Bachelor's of Science in Mechanical Engineering from Sacramento State
5 University, California.

1 **EXHIBIT A4NR-1: ATTACHMENT 4**

2 **QUALIFICATIONS OF DAVID J. WEISMAN**

3 David Weisman is an educational multimedia creator, with clients are as varied the United States
4 Agency for International Development, executive producer Oliver Stone, and currently the Alliance for
5 Nuclear Responsibility (“A4NR”). His work has won praise for its depth and accuracy.

6 From 1995 to 1999, Mr. Weisman produced and directed PRESERVING THE LEGACY, a series of
7 twenty-eight programs on environmental science and policy for educational broadcast over PBS. Topics
8 focused on environmental history and regulation, including nuclear energy and radioactive waste disposal.
9 Funded and sponsored by the National Science Foundation, Mr. Weisman developed original content and
10 research in conjunction with an academic peer-review advisory panel. The completed programs, in addition
11 to airing over PBS, garnered a 1997 Silver Screen Award at the U.S. International Film and Video Festival
12 and a 1998 Cindy Gold Award for science and mathematics programming.

13 In the following decade, Mr. Weisman directed the video portion of “The Texas Legacy Project” for
14 the Conservation History Association of Texas. For this compilation of oral history interviews with prominent
15 conservationists, regulators and officials, he conducted hundreds of hours of original interviews, which he
16 collated into an on-line database and ultimately transcribed and co-edited into a companion book, The Texas
17 Legacy Project, that was released and published by the Texas A&M University Press in October 2010.

18 Bringing these media skills to the prominent issue of nuclear energy in California, Mr. Weisman
19 became a co-founder of A4NR in 2005. During his tenure with A4NR, he has participated in all of the
20 proceedings before the California Public Utilities Commission in which A4NR has been a party, beginning in
21 2006 with his research in conjunction with A4NR’s showing in Commission Docket No. Application 05-12-
22 002 (the *Pacific Gas & Electric Test Year 2007 General Rate Case*). In 2010 and 2011, he prepared the
23 research and co-wrote the documents submitted by A4NR in Commission Docket No. Application 10-01-022
24 (the *Diablo Canyon License Renewal Cost Application*), and did likewise for the Commission proceedings
25 involving seismic testing at nuclear plants, Commission Dockets Nos. Application 10-01-014 and Application
26 10-11-015.

27 In his role as Outreach Coordinator for A4NR, Mr. Weisman’s other responsibilities include the writing
28 of press releases and editorials, and creating public awareness of ratepayer concerns via presentations on
29 local radio and television (KCBX, KVEC, KSBY) as well as national exposure (KPBS, KFPK, KPFA, KCRW).

1 He also conducts educational outreach to elected officials and their staffs in Sacramento and Washington,
2 D.C., as well as engaged in public speaking before county supervisors and local city councils. Mr. Weisman
3 has drafted California legislation (e.g., 2016 Assembly Bill 361 (Achadjian) and 2013 Senate Bill 418
4 (Jackson)) and provided detailed research to the authors of 2006 Assembly Bill 1632 (Blakeslee) and 2016
5 Senate Bill 968 (Monning), all of which were related to nuclear energy production.

6 Mr. Weisman's participation in Commission-mandated Diablo Canyon Independent Safety
7 Committee proceedings has instigated the Committee to submit Freedom of Information Act inquiries to the
8 U.S. Nuclear Regulatory Commission and other agencies. His work has also prompted the Committee to
9 conduct subsequent investigations regarding issues he has brought to their attention. Additionally, he has
10 written comments and testimony filed in proceedings before the State Water Resources Control Board and
11 the California Energy Commission.

12 Mr. Weisman was appointed by the Morro Bay City Council to its Community Promotions Advisory
13 Committee and served a four-year term on the committee, two of which as Chairman. During his service on
14 this committee, he gained considerable insight into the drivers of the San Luis Obispo County economy,
15 which includes both tourism and energy production as principal sectors to the community's economic health.

16 Mr. Weisman enjoys the arts and playing the Handel Piano Suite in G in his spare time.

APPENDIX

**Stipulation Between Pacific Gas and Electric Company
And the Alliance for Nuclear Responsibility
Regarding Annual Diablo Canyon Revenue Requirement Tier 3 Advice Letter**

Application 16-08-006

Stipulation Between Pacific Gas and Electric Company And the Alliance for Nuclear Responsibility Regarding Annual Diablo Canyon Revenue Requirement Tier 3 Advice Letter

1. In Pacific Gas & Electric Company (“PG&E”) Application (“A.”) 16-08-006, as described in Chapter 10 of PG&E’s Direct Testimony, PG&E proposed an annual advice letter filing that would true-up capital expenditures and depreciation of plant to reflect the plant additions completed subsequent to 2016. The objective of this proposal is to depreciate Diablo Canyon Nuclear Power Plant (“Diablo Canyon”) net plant-in-service to zero and recover such costs in rates by the time the units are taken out of service in 2024 and 2025. This advice letter will adjust the revenue requirement for Diablo Canyon that is adopted in the most recent General Rate Case and, if the revenue requirement submitted in the advice letter is approved by the Commission, will be incorporated into the Annual Electric True-Up (“AET”) filing on an annual basis.

2. As described on page 10-8 of PG&E’s Direct Testimony, PG&E proposes to establish a new two-way subaccount (the “Diablo Canyon Capital Depreciation Subaccount”) within the proposed Diablo Canyon Retirement Balancing Account to track and adjust the capital revenue requirements for Diablo Canyon. Beginning in 2017, PG&E will file in May of each year a Tier 3 advice letter to: (1) forecast the next year’s capital related revenue requirement for Diablo Canyon; (2) true-up authorized capital-related revenues to reflect the actual gross plant additions for the previous year; and (3) show the depreciation by vintage of gross additions (“Tier 3 Advice Letter”). PG&E has proposed that the annual Tier 3 Advice Letter receive Commission disposition no later than the first Commission business meeting in December of the year of submittal to ensure that the updated revenues for the next year are able to be included in electric rates on January 1 of the next year through the AET advice letter. As stated on page 10-6 (lines 11-12) of PG&E’s Direct Testimony, capital additions for Diablo Canyon will remain subject to reasonableness review in PG&E’s general rate cases.

3. The Tier 3 advice letter process described above implements certain provisions of the settlement entered into by PG&E and the Alliance for Nuclear Responsibility (“A4NR”) in PG&E’s Test Year 2017 General Rate Case (A.15-09-001). After further discussions, PG&E and A4NR have reached the following agreements about the information that will be provided in the annual Tier 3 Advice Letter. This Stipulation memorializes these agreements and clarifies and adds the following details to PG&E’s proposal:

- A. New Capital Projects In Excess of \$20 Million: If a new Diablo Canyon capital project is completed during the reporting year that was not forecast in PG&E’s most recent general rate case and the cost of such project exceeded \$20 million, PG&E will include the detailed project justification submitted to its Executive Project Committee (“EPC”) as an attachment to the Tier 3 Advice Letter. To the extent any part of such documentation is confidential, the public version attached to the Tier 3 Advice Letter may be redacted and the confidential information will be provided to parties subject

to a non-disclosure agreement executed in accordance with Commission practice and procedure.

- B. Cost Exceedance on Projects In Excess Of \$20 Million: If a Diablo Canyon capital project in excess of \$20 million that was forecast in the most recent GRC is completed during the reporting year and, pursuant to PG&E's internal operating practices and procedures, required a subsequent EPC review due to cost overruns above the approved project amount, PG&E will provide any project justification submitted to its EPC as an attachment to the Tier 3 Advice Letter. To the extent any information that is a part of such documentation is confidential, the public version may be redacted and the confidential information will be provided to parties subject to a non-disclosure agreement executed in accordance with Commission practice and procedure.
- C. Cancelled Projects: On pages 10-6 and 10-7 of PG&E's Direct Testimony, PG&E proposes a process for addressing cancelled Diablo Canyon capital projects. This testimony states that PG&E will submit a report in the AET advice letter addressing such cancelled projects. PG&E hereby modifies and clarifies that the cancelled project report described in PG&E's testimony will be submitted with the Tier 3 Advice Letter so the results can be reflected in the AET.
- D. Protests: Any protests to the Tier 3 Advice Letter will be handled according to the procedures set forth in General Order 96-B.

4. This Stipulation is entered into between PG&E and A4NR. PG&E and A4NR will request that the clarifications, modifications and additions described in this Stipulation be adopted by the Commission in its final decision on A.16-08-006. PG&E and A4NR agree that A4NR is authorized to attach this Stipulation to A4NR's prepared direct testimony filed in A.16-08-006.

By: /s/ William Manheim
Attorney for Pacific Gas & Electric Company

By: /s/ Alvin S. Pak
Attorney for Alliance for Nuclear
Responsibility

Dated: January 23, 2017